

# HOME COMPUTING WEEKLY

AN ARGUS SPECIALIST PUBLICATION

July 30-5 August 1985 No. 123 50p



Score a Century!



100 PRIZES

Graham Gooch's TEST CRICKET games from Audiogenic

Whirlinurd and Ghost Chasers New games from



reviewed inside p.10

## Olivetti cash revives Acorn

Acorn has been rescued from imminent bankruptcy by Olivetti. The Italian electronics giant has bought £4m of Acorn shares to give it a 79.8 per cent stake in the company.

As part of a refinancing package Acorn's major creditors have agreed to write off debts amounting to £7.9m and the BBC will waive 50 per cent of royalties owed over the past year.

Alex Reid, chairman of Acorn said, "We were on the verge of receivership and if any of the parties involved in the refinancing plan had not agreed the receiver would have been called in."

Alex Uboldi, an Olivetti executive who has been in charge at Acorn during the recent financial crisis said the company was in "a stable condition".

"The financial problems have not impaired Acorn's major projects for the future and new products are on the way."

The first of these, added Mr Uboldi, is the Cambridge Workstation which should be ready at the end of July.

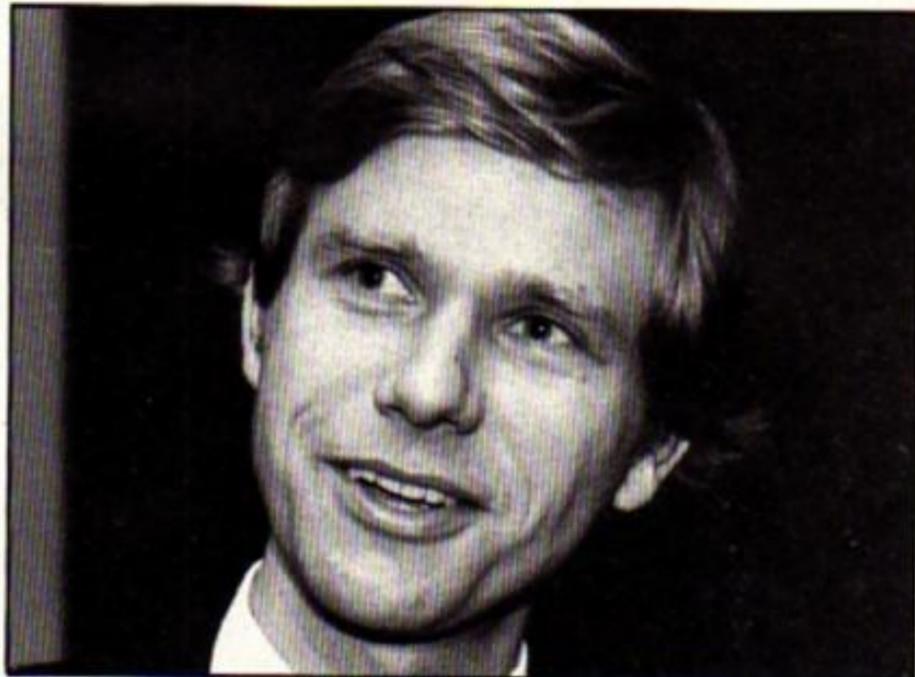
Acorn has also announced the appointment of a new managing director. He is Brian Long, 41, who has previously held executive positions with Massey Ferguson in Canada and Europe.

The financial difficulties at Acorn have cast doubt over the future of the BBC, BBC B+ and the Electron but Herman Hauser, deputy chairman of Acorn stated, "We have a continued commitment to BBC machines and a number of add-ons are in the pipeline."

Mr Hauser declined to confirm or deny whether production of the BBC would cease in the near future but said, "The main emphasis will be on the BBC B+."

As part of the new deal with the BBC, "Acorn has agreed to continue to introduce new models in the future."

Alex Reid commented that the Electron "was still being made and delivered to suppliers." He added, "We will continue to provide support for the 200,000 Electron owners."



Herman Hauser - Acorn's Deputy Chairman

### Hackers enter war machine

Seven American teenagers have been arrested and charged with using their home computers to hack into a top secret military computer system.

The hackers, whose computers and software has been seized, also re-programmed a communications satellite's position and disrupted telephone calls on two continents.

The case has caused concern over national security and inspired comparisons with the film "War Games" in which a home user gains access to American Strategic Command computers and almost sets off World War III.

Alan Rockoff, the lawyer prosecuting the case said, "It's like 'War Games' only it's real life. It's happening today. They got into a defence command computer and in that program were direct lines to the supervisors of sensitive sections of the armed forces."



War Games a reality?

The case raises questions about Britain's military computers' vulnerability to illegal entry. A Ministry of Defence spokesman told HCW that the MOD were aware of the case. "We keep in touch with developments and see what lessons can be learnt," he said, "but we are confident that our classified data is adequately protected."

Bright Sprites for your Commodore p.34

Free Music conversion pull-out chart p.24

HCW bugs... Wunda-worm and Beezy Bee

Who is Ron Complex? p.9

Another chance to save 50p on Tronix membership





# Bet you can't sit still when playing

Guide bouncy 'Thing' through this underworld fantasia searching for the armoury to equip himself carefully for the final encounter with the evil Toy Goblin.

Commodore 64



# THING ON A SPRING



Gremlin Graphics, Alpha House, 10 Carver Street, Sheffield S1 4FS. Tel: (0742) 753423

# HOME COMPUTING WEEKLY



War games — is it real?

## Soapbox

After all the unholy glee in some sections of the computer press at the failure of the first Acorn, then Sinclair Research, there has followed a time of sombre serious editorials reminding us that Sir Clive is the father of the mass consumption computer market and that we should all be grateful to him, which is true. The failure of the QL to attract a large consumer base is often cited as one of the problems.

With the exception of the QL, I bought everything Sinclair announced as soon as it was available on mail order... and I learned. I had to wait months for it with my money frozen; when it arrived, it didn't work. When I relied on it, I couldn't get loan equipment, and the names and phone numbers of the ladies in Customer Relations at Cambridge and Camberley were engraved my on telephone bill and I learned that "immediately" usually meant in two weeks, and "two weeks" meant almost never.

Non "Sinclair-people" need not feel self satisfied either! Remember the equally shameful BBC Micro introduction, or the continuing saga of faulty Commodores? Could it be that the computer bubble hasn't so much burst, but been squeezed by the arrant complacency of the manufacturers to the extent that the enthusiasts who have always formed the bedrock have become older, wiser and won't get fooled again, no matter what the name on the micro? **D.M. (Software reviews)**

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- Continuing Bright Sprites for the C64
- Into the Time Capsule with Cuthbert
- Plus — a gamut of games, latest news, round-up of reviews, and competitions.

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M.U.D is...



the Pig on the  
poop deck



The 8th  
**Personal  
Computer  
World  
Show**

**4-8 SEPTEMBER 1985  
OLYMPIA, LONDON**

Sponsored by Personal Computer World

**Meet us there!**

You will be fully aware by now that the Personal Computer World hits town from 4-8th September.

The show, which will be at the Olympia Exhibition Halls, is probably the biggest in Britain and features all the big names. Britain's biggest name in computer magazines, Argus Specialist Publications, will also be having a stand... part of which will feature your very own HCW.

We thought that we would take this as an opportunity to meet our readers and after weeks of begging, Argus have agreed to unlock the foot shackles and let us out of the

dungeon.

So for the three public days of the show, Friday, Saturday and Sunday, someone from the editorial team will be on the stand to answer your questions, compliments and listen to your complaints.

It will provide a chance to hand in your Hi scores (with a picture we hope), give us your bouquets and brickbats and even to meet Ron Complex. In fact we will arrange it so that any reader who correctly identifies Ron Complex will win a prize!

Please don't bring your programming problems though, we can handle them by letter much faster and with more detail. Don't forget to say hello!

**At the Show**

You will all be aware, by now, that the PCW show is due to blast off in early September and a number of companies are aiming to have new products ready for the event.

We will bring you the details and whiffs of gossip as soon as we get them. So look out for this column with all the up-to-date information.

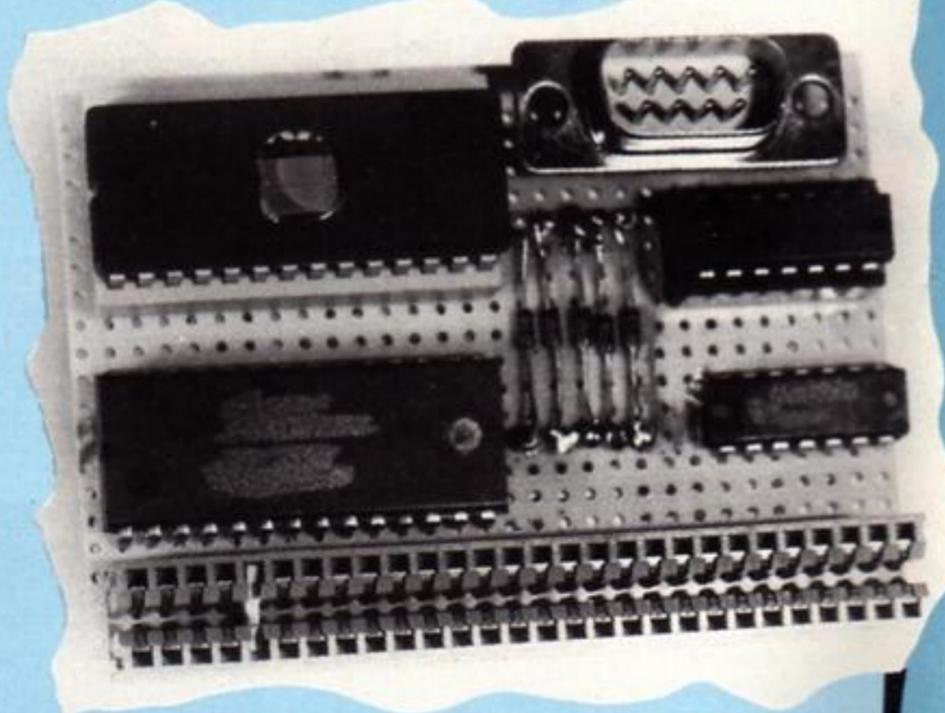
Mikro-Gen have a brand new product concept, that will be revealed and demonstrated at PCW. At its basic level it is a soft and hardware combination for the 48K Spectrum that will give the machine a 56K total user memory. The first game to make use of this package will be Shadow of the Unicorn, an adventure which would have been impossible to write on the un-expanded Speccy.

The pack will contain a book, the add-on Rom unit shown here and a cassette containing the rest of the program. Besides the Shadow of the Unicorn, the ROM will also have a tape alignment routine that is instantly loaded by simply plugging in the add-on and a microdrive routine to allow you to load the other part of the program from your microdrives and therefore save all that time!

The price of the complete package is, wait for it, just £14.95, or thereabouts. Sounds like good value to us but we will review it as soon as we can.

Virgin Games tell us that they aren't going to be at the show but might be appearing in your homes soon enough. I'll let you try to work out how.

They are currently working on a new game featuring a 1950's comic book hero. Now who could that be? Answer next week and positively no prizes!



Prototype of the main board



Mikro-Gen's Spectrum memory module

### Software Update

It seems to be a week for BBC and Electron users judging from the new releases. That isn't too much of a surprise with the Acorn Show being so close!

The releases from Vannin software are all educational programs aimed at junior aged children with BBC machines. They are only available by mail order at the moment. We hope to have reviews of them soon.

Bevan Technology, who recently introduced the BBC bridge interface module, has waded into the software market with five new BBC titles. All are arcade type games and a few are reviewed in this issue of HCW. It claims that the games have a very high addiction level but check this out on our review pages.

Sparklers is effectively doubling its range with the release of its four new titles. All are in the £2.50 price bracket and hope to capture the pocket money market.

The most interesting title looks to be St Crippens where you are admitted to the worst hospital in the world. The aim of the game is to escape from the ward, find a new set of clothes and avoid all the medical "help" that pursue you. There is even a genetic engineering department with all its attendance terrors to avoid.

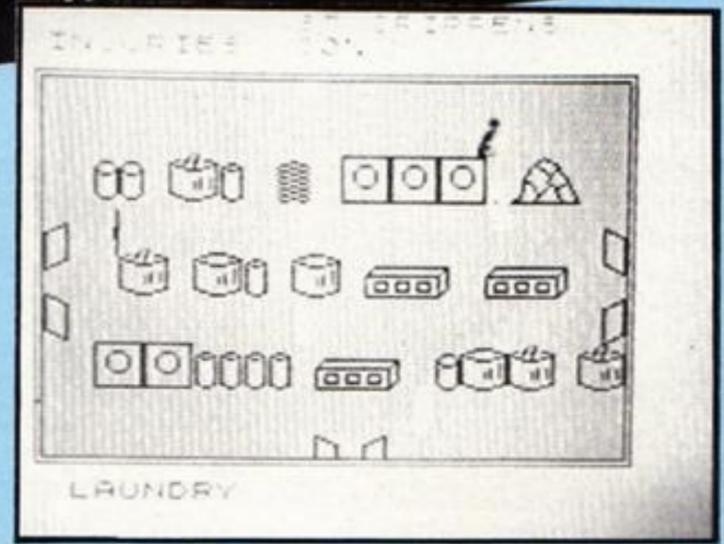
English is getting all excited about its new Chop Suey game which it claims to be the first Atari Kung fu game programmed at this side of the big divide. The game has all the usual features with "surprises of the animal variety" — the mind boggles as to what they could be.

**Vannin Software, 133 Boroughbridge Rd, York YO2 6AA**  
**Bevan Technology, Gresham Chambers, 14 Litchfield St,**

**Wolverhampton WV1 1DG**  
**Sparklers, 296 Farnborough Rd, Farnborough, Hants GU14 7NF**

**English Software, 3rd Floor, 1 North Parade, Parsonage Gdns, Manchester M60 1BX**

Title	Machine	Price	Publisher
Beta-Base Utilities	BBC	£12 (Disc)	Clares
Kayak	C64	£2.50	Sparklers
Merlin	C64	£2.50	Sparklers
Desert Burner	Spectrum	£2.50	Sparklers
St Crippens	Spectrum	£2.50	Sparklers
Chop Suey	Atari	£8.95	English
Williamsberg Adv 3	Enterprise	£3.95	Microdeal
Ultimate Adv 4	Enterprise	£3.99	Microdeal
Castle Dracula Adv 5	Enterprise	£3.99	Microdeal
Spider Speller	BBC	£5.00	Vannin
Facts of Europe	BBC	£5.00	Vannin
Racecount	BBC	£5.00	Vannin
Laser Attack	BBC	£5.00	Vannin
Double Turn	BBC	£5.00	Vannin
Golden Maze	BBC	£5.00	Vannin
Bolder Dash	Amstrad/Atari	£9.95	Mirrorsoft
April Showers	BBC	£7.95	Bevan Tech
Aabatron	BBC/Electron	£7.95	Bevan Tech
May Day	BBC	£7.95	Bevan Tech
One Last Game	BBC/Electron	£7.95	Bevan Tech
Digital Defender	BBC	£7.95	Bevan Tech
Covenant	Spectrum	£6.95	PSS
Bio-Defence	Atari	£9.95	Tymac



M.U.D is...

"the Host in the machine"

01-608 1173

# MIRRORSOFT

MEMO FROM: THE WAR DEPARTMENT, MIRRORSOFT  
TO: ALL RAF SPITFIRE '40 PILOTS

## HOW WE LOST THE WAR

MIRRORSOFT are extremely sorry to have to announce that the first Spitfire 40 pilot to claim the coveted role of Group Captain, DSO DFC VC is in fact an under-cover agent from the Fatherland.

Come on, you Brits, liven up! This is just not good enough, chaps. The Luftwaffe cannot be allowed to get away with this. The gauntlet has been thrown down, and it's up to you to accept the challenge. We just can't have spies running the RAF!

We expect to see the results of your labours by mid-August, or we will not be responsible for the consequences to this great country of ours.

Your response should be addressed as follows:

SPITFIRE DIVISION:  
MIRRORSOFT LTD  
MAXWELL HOUSE  
74 WORSHIP STREET  
LONDON: EC2

## SOFTWARE FOR HOME COMPUTERS

### Card-Power

Micro Power, the publishers of the successful BBC game Castle Quest (a more complex sequel for a variety of machines follows in the Autumn) are now producing hard and software for the Amstrad in their Superpower range.

Immediately available is a cased sideways Rom-card for

the CPC 464 which allows the user to fit up to seven sideways roms acting as foreground, background or extension roms.

The card simply fits straight onto the back of the machine and is priced at £39.95 plus 95p p+p.

**Micro Power, Northwood Hse, North St, Leeds LS7 2AA**



The Superpower Sideways Rom-card

### All-Points-Bulletin

Yes, this is an APB from HCW to all Atari-48K-users who fancy using their literary skills to review software for us.

All you need do to join our ranks of software Shakespeares is to send your details (name, address, machine and any relevant experience) to Kerry Fowler at the HCW offices and we'll take it from there.

**HCW, No. 1 Golden Sq, London W1R 3AB**

### A Little Light-Music

If you're a music-lover and appreciate the sounds of Duran Duran through to Haydn then Hybrid Technology's latest audio cassette will have you singing their praises.

The 40-minute tape was produced with its Music 500 synthesiser for the BBC, and according to Hybrid, will allow you to enjoy the benefits of a complete orchestral sound without a studio full of equipment.

"An Evening in the Company of the Music 500 Synthesiser" is available direct from Hybrid and costs £1.95.

**Hybrid Technology, Unit 3, Robert Davies Ct, Nuffield Rd, Cambridge CB4 1TP.**

### Testing-Times

Amstrad Consumer Electronics came out with lowest percentage return on faulty machines in a recent survey by a chain of computer centres in the North-West of England — with 1.8% being returned.

In the same survey, which Sinclair dismissed as unrepresentative, Commodore returns were 17.4%, BBC 'B' 17.4% and Sinclair Spectrum 30.6% — as opposed to their own figure of "around 12.5%". (HCW 121).

These figures were arrived at from 'dead on arrival' stock and did not include machines returned after 30 days purchase.

Amstrad, who has been in the computer market for just over a year, produces the CPC464 and CPC664 and are obviously pleased with the results of this particularly survey.

### Disc Drivers

Mr G Pomery, an HCW reader from north of the border, will be speeding his programming very soon, when he receives his prize in our Disc Drive Competition.

His entry was the first out of Bryan's small hat (there were only five envelopes in it) which listed the same order of letters as the Editor. The winning order was A,D,F,C,B,E.

The 20 runner-up prizes go to those readers with the letters nearest to the winning combination. Roland in Space was chosen by: K Chua, Birmingham; I Pigney, Brentwood; Paul Leonard, London; D Greenhalgh, Altrincham; Colin Powell, Salford; A Billingsley, Trowbridge; E V Browning, Llanedeyrn; B D Everingham, Romford; R H Evans, Brigend.

The following readers are looking forward to Blogger appearing on their doorstep: P J Wilson, Southampton; Malcolm Allen, Coalville; Michael Skinner, Burton; George Pilch, Gwinear; H Colborn, Londonderry; Mark Phillips, Padstow; Andrew Peel, Rochdale; Jane Boddy, Avon Tyrell; P D G Soundy, Kinloss; B Bullock, Seacroft; James Davies, Ferryside.

There are only four readers looking for Roland in Space, The Prize or Punchy. They are: Ian Neve, London; R F Holt, Teignmouth; S M Crimson, Willesden; W Smith, Sheffield.

Congratulations to all those who won and to those who came close to the winning combination. We did say that the Editor had a strange and devious mind!

PRIVATE

# ENTERTAINMENT

magazine.

JULY/AUGUST  
1985

ISSUE 1  
An I.E.U.G publication



Up to date News. Latest Software reviews. examined: Ports. Readers PROGRAMS Graphics: CHANNELS and more...

## Enterprising enough?

We have recently received a copy of the first magazine to be produced by the Independent Enterprise User Group and although we don't often recommend rival magazines we have to admit that it is a very good first issue.

It is a 24 page, A4, Black and White magazine packed with

news, reviews and programming hints. There is an article on interfacing to the Enterprise which includes details of do it yourself cable making!

In all it is a very brave, and well put together, first effort and can be recommended to our Enterprise owning readers.

**Independent Enterprise Group, 40 Mansfield Rd, London NW3 2HT.**

## Dragon Slayer

Barry Ward from Wokingham fought off other Dragon fanatics to win a complete Cumana disc drive system in Incentive's Back Track Champ competition.

Barry won the competition to complete Back Track in the fastest time at Incentive's

offices in Reading, slaying four other finalists on his way to victory.

However, Barry didn't quite leave them for dead and the five of them managed to collect their prizes from Back Track author, Chris Andrew.

Barry Ward collects his Cumana system from Incentive.



School photo — Computer Press 1985



Bob Hillyer and Mike Male, co-authors of Southern Belle

## All Steamed Up

Hewson Consultants, one of the oldest surviving software houses, recently celebrated five years of trading with a gathering at Didcot Railway Centre.

This small remnant of the Great Western Railway is only three miles from the company's HQ at Abingdon and the occasion also featured the first showing of the new game Southern Belle which is reviewed elsewhere in this issue of HCW.

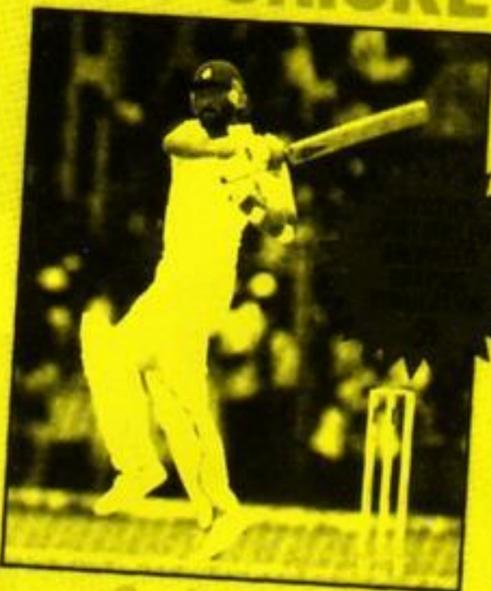
The event was a chance for the country's computer press to get together and we were all

marshalled together for our "school" photo, as Andrew Hewson kept calling it.

This is the first occasion that Bryan Ralph, our new assistant editor, has been allowed out of the office, well — we have to protect the public as much as possible, so to celebrate this event we are offering a prize to the first reader to return the "school" photo, or a photocopy, to us with the correct face ringed. Entries from industry personalities and his wife will not be accepted.

**Hewson Consultants, 56B Milton Trading Est, Milton, Abingdon, Oxon OX14 4RX**

*Graham Gooch's*  
**TEST CRICKET**



*Audiogenic*

*Graham Gooch's*  
**TEST CRICKET**



**Catch one of a century of Graham Gooch's Test Cricket games in this week's competition**

**Y**ou could be walking back to the pavilion with a copy of Graham Gooch's Test Cricket for the C64 under your arm if you can spot the number of famous cricketer's names cunningly concealed in the word square.

Audiogenic's game, sold at £9.95, uses graphic animation and joystick control for either batsman or bowler to create an exciting simulation of run scoring and wicket-taking without the dangers of body-line bowling. The big match atmosphere is enhanced by sound effects and speech and the armchair cricketer can choose to play a full two innings test or opt for limited overs.

Team selection is, of course, vital and you can select from squads of England or Australian players or using a free extension programme you can fantasise about your all star line-up from the annuals of cricketing history.

Between overs the scorecard and bowling figures are flashed on screen for the benefit of statistic-addicts.

To win one of these fast load cassettes you don't have to be a cricket buff and name the opening batsman for England in the third test against Australia in 1897 or the name of the groundsman responsible for manicuring the sacred crease at Lords. Instead we've devised this test (which shouldn't take five days) to pick out the well-known wizards of the willow and lobbers of the leather orb from the confusion of letters.

**How to enter**

Study the wordsquare. Hidden in the square are the names of test cricketers past and present. When you have found as many as you can, circle them clearly on the wordsquare and fill in the coupon clearly and carefully.

Write clearly the number of words you have found on the back of the envelope. Post your entry to Graham Gooch Competition, Home Computing Weekly, No.1 Golden Square, London W1R 3AB. The closing date is first post on Friday 16 August 1985.

**Important:** please follow

carefully the guidelines on entering — incomplete coupons and entries with no numbers on the back cannot be considered.

If you are a winner, the coupon will act as a label for your prize, so clear writing is essential.

**The rules**

- Entries will not be accepted from employees of Audiogenics Software Ltd, Argus Specialist Publications and Alabaster Passmore & Sons. This restriction also applies to employee's families and agents of the companies.
- The How to enter section forms part of the rules.
- The editor's decision is final and no correspondence can be entered into.

**HOWZZATI!**

**Graham Gooch Competition**

*Entry Coupon*

Name \_\_\_\_\_

Address \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_ post code \_\_\_\_\_

**Number of words found** \_\_\_\_\_

Complete clearly and fully — if you are a winner this will act as a label for your prize. Post to: Graham Gooch Competition, Home Computing Weekly, No 1 Golden Square, London W1R 3AB. Closing date: first post Friday 16 August, 1985. Don't forget to follow closely the advice in the How to enter section including writing the number of words you have found on the back of your envelope.

F O W L E R B W O B V A K P T L  
 I V A B L K I N X U O U L O D M  
 G B I G U Z A D S N B Y C B V T  
 B A C Q I P M T U D X T C J T A  
 O M T O J S L R T L T A K O X P  
 X C M T R G B S W A L I N B T U  
 H J S E I G O N D W I K L E V T  
 B O B T U N O O V B L X Z W O T  
 L O O V T A G W C C L I D M L L  
 S X T M U Z B I E H O J O T J P  
 U A X H B I K C M R Y W A I U V  
 P N G R A C E L Z W D M D X T O  
 A V W J P M T V I L O D P R A B  
 K A R I O T A J J W I M E I E L  
 O T P L I L L E E P J O Z X U Y  
 L K X A P V I S C Z U T V O K T

# RON COMPLEX



**Introducing Ron Complex, private investigator, in a computer thriller with a plot that makes a maze look like a one-way street. Follow this serial and your life will never be different again**

## Part One: The Thaw Before the Storm

Ron Complex was in a bad mood — he'd been defrosted too quickly. He was the only person in the boardroom of Murkotronic Computers Inc who was visibly steaming. He was the only one wearing a t-shirt with "Suspended Animation is Fun" written on the front. Ron felt out of place.

He was sitting at a huge oval table and around him a semicircle of executives were frantically scribbling memo's and slipping them into each others pickets. They all looked worried. Ron caught a glimpse of a note before it disappeared from view. J' said, "I'm really wor-

ried. How worried are you?"

Only one seat at the table was empty. Behind the vacant chair, on the wall, was a plaque inscribed with the words, "What I don't know about computers even the computers don't know."

Suddenly the door of the boardroom was flung open. Everyone in the room froze — except Ron. Standing in the doorway was Harvey J. Murko, head of the biggest computer multinational in the world. At the age of 12 he had revolutionised the computer by inventing the Murkodrive and now 20 years on he was known simply

as "King Silicon".

"So how was the deep freeze, Complex? Catch a chill?" "Cut the cracks Murko, you'd better have thawed me out for a good reason," snapped Ron. "But I have. I loathe to say it but I need you Complex. You are the only man alive who can undertake this mission."

A warm glow of satisfaction spread through Ron's body. He knew that his biggest hunch had paid off.

"So you need me do you? I remember how 20 years ago everyone laughed at me when I said one day the world would need someone who knew absolutely nothing about computers. Now that day is here."

Way back at the beginning of the computing era, in the time now called "the Pong Dynasty", Ron had foreseen trouble ahead for a computer dependent society. He organised Computer Avoidance Training courses which consisted of tips on hiding in airing cupboards. Nobody came. Finally, exasperated, he put himself into cold storage until that time when his total lack of computer expertise would be called on to solve the crisis.

As the refrigerator door closed, two decades before, Ron had waved goodbye to his trusted friends who would guard his secret and reactivate him when they felt the insight of his ignorance could save the day.

But the temptation was too much and Ron's plan to put himself on ice was leaked to the press. For a day Fleet Street gave over their front pages to the man they called "the human fish finger."

Then over the years the world forgot Ron, all except Harvey J Murko who had filed Ron's details away in the memory banks under the heading, "Loonies who may come in handy."

Ron Complex, private investigator, and now the planet's most advanced computer illiterate slammed his fist down on the boardroom table. "Just one thing before you tell me what this mission is Murko — where do I get hold of a raincoat with a turned up collar and a battered trilby hat?"

**Next week: Part Two: Slightly into the Labrynth.**

SOFTWARE SOS



**Frankie Goes to Hollywood**

Frankie is not so much a game as a compendium of games united by a single aim. The idea is to progress from Mundanesville through to the Pleasure Dome increasing your personality to maximum as you do so. Along the way there are puzzles to solve and action screens to be overcome, each with its own reward. Most of the games inter-relate and objects gained in one can be essential keys to another.

The superb graphics place you in the streets of Mundanesville and you must enter each house in turn searching and touching objects as you go. If any objects looks useful then it may be carried with you but you can only carry a limited number so the choice must be made carefully. Using video cassettes or touching pictures can allow you to enter the action screens, once you learn how (I'm not telling). There are 10 action screens in all and objects found in the houses usually enhance your chances of success.

At one point you discover that a murder has been committed and it is your task to deduce who the murderer was from clues which may be collected in the houses. This had me running for a pencil and paper because there are about a dozen suspects and it is impossible to keep track of all the clues. Solving the murder rewards you with more personality points, but what are these all important factors?

Personality is divided into four elements (pleasure, war, love and faith) represented by four columns at the side of the screen. As you complete each

game the columns increase in height and Frankie gives you occasional reports on the percentage of your full personality which the total of the columns represents.

The ZTT Room has a large screen and a set of buttons pressing the buttons lights up a different part of the screen or turns it off again. Success is achieved by lighting up all of the ZTT symbol. The Sea of Holes is inspired by the Frankie symbol from which the hero character of the game was derived. As you disappear into one hole you reappear from another. If you reappear on the base line of the screen you are rewarded with a chance to enter another action screen. I think you will see by now that the screens are varied, all use superb graphics and there have been no bytes spared to produce this game.

There is even a maze which can be mapped by noting the colour of the manholes which are found there. These are the Corridors of Power in the Pleasure Dome itself and when your personality is complete the door to the final screen will be revealed here. The final screen? The title screen itself. Such is the elyptical nature of this game.

My only criticism of this game is the computerised version of Relax which plays while the program loads. It sounds awful. Don't worry though, there is a free live recording of Frankie doing the same song on a separate tape in the box. Take my advice, stick that on the hi-fi and turn the sound down on your TV during loading and remember Frankie says buy this and you'll have Ocean's of fun. **E.D.**

**Price:** £9.95

**Publisher:** Ocean

**Address:** 6 Central St, Manchester M2 5NS



**Ghost Chaser**

When judging a game, one yardstick which I rarely have to use is the length of time it takes to complete. Unfortunately this measure comes into play in my review of Ghost Chaser. I succeeded in completing all 16 screens, caging the phantom by doing so, which only took about two hours. The disappointing fact is that there isn't a higher level, so once you have completed it there is no challenge left.

The game tells the tale of a little bear, who looks very much like Sooty, and his aim is to rid a ramshackle house of its spooky occupants. Our intrepid ursean ghostbuster does this by moving from room to room, collecting all the keys to unlock every room in the house. Occasionally the phantom materialises but he can be dispelled by blasting him with cannonballs whenever possible. This has the effect of making the ghoul disappear for a while, presumably to lick his wounds. Teddy bear's ammunition is in plentiful supply lying around the house and they can be picked up by merely walking past them.

The rooms also contain smaller spooks, bats, ghostly flames or dripping pipes. Contact with any of these gives Teddy the shivers and three contacts in any one room means death to the bear (luckily he has five lives). Death can also result from a misjudged jump or by falling down a trapdoor.

The game is quite enjoyable to play and because of this it just misses a Comatose rating but buyers should beware of the limitations which I outlined at the beginning of this review.

**E.D.**

**Price:** £9.95

**Publisher:** US Gold

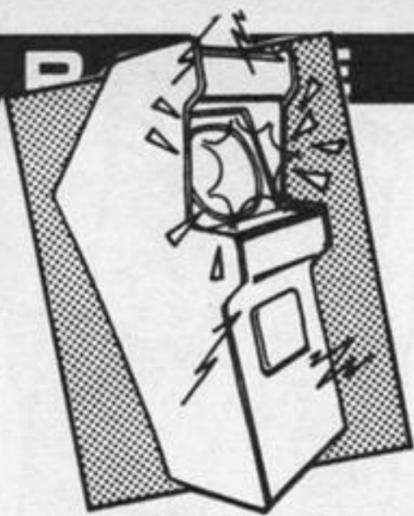
**Address:** Unit 10, The Parkway Ind Centre, Heneage St, Birmingham

C64



C64





**Whirlinurds**

A Whirlinurd is known to its friends as a Nurd. It is a little creature with helicopter blades on its head and it lives in a dangerous world of mazes. Whirlinurds are an example of one of nature's magpies, the ultimate consumer snapping up anything that takes their fancy.

Wherever the Nurd goes there are creatures intent on preventing him from getting the television sets, candlesticks, spectacles and other such desirable objects which litter his landscape. The most common enemy is a bouncing eyeball which appears to be a gregarious creature, often found bouncing up and down in large groups. Slightly less common are the snakes which dash backwards and forwards across many of the higher level screens. Other high level problems include moving force fields, live terminals and pulsating nodules.

Using a joystick you can move the Nurd left and right and the fire button switches on his rotor blades lifting him up off the ground. In tricky situations a boosted lift can be achieved by pushing the stick forward at the same time as pressing the fire button, but this facility can only be used once in each screen.

Some of the screens require you to find keys which open walls in the maze allowing access to trapped objects but this also releases whatever terror may be lurking inside the compartment.

Whirlinurds will not extend the limits of C64 programming but it does give a degree of enjoyment and I found myself wanting to play on to see what the next screen had in store. However, this is not one of US Gold's greatest games. **E.D.**

**Price:** £9.95

**Publisher:** US Gold

**Address:** Unit 10, The Parkway Ind Centre, Heneage St, Birmingham

**C64**



**April Showers**

It sometimes seems as if we can't move for Beeb games in Mode 2. All too often they just take the superficial aspects of Frak! but without the winsome originality; until April Showers that is. In fact, this game is so original I can't think of anything quite like it and I'm still trying to work out just what you have to do, let alone manage to do it!

The plot is simple. You are a little cloud with eyes (what?) whose pleasant task is to water the plants in the garden (aaah!). However, the naughty flying umbrellas will steal your rain and kill your plants (grrr!) unless you water them and put them out of action. Your own liquid supplies are replenished from the other little clouds (without eyes) which flit across the sky. Yup, pretty original.

Unfortunately, there are no instructions apart from the control key display and it takes a few moments to work out even in a rough way what it is you have to do. As you scroll

right or left the little eyes flick from side to side and the sky and ground move in relation to you, centre screen. Your options, apart from shifting the whole display, are to fire (i.e. rain on things) and zip up and down to collect water from the other clouds and come into contact with the brollies. This is wild!

No doubt there are patterns and tactics which will emerge but the only rational response on initial play is to watch the little clouds and snarl at the brollies. How often does a game make you smile even when you lose?

This is superb fun — one of the most playable games I've seen for a long time but also one of the simplest. Proof positive that you don't need 64K of code or giant databases on disc to be compulsive. Whether it's non-violent as well is something you'll have to decide but it's certainly the most compulsive non-destructive zapper I can recall. Shame about those instructions, though... **D.R.**

**Price:** £7.95

**Publisher:** Bevan Technology

**Address:** Gresham Chambers, 14 Lichfield St, Wolverhampton WV1 1DG

**BBC**



**Flipped**



**Hooked**



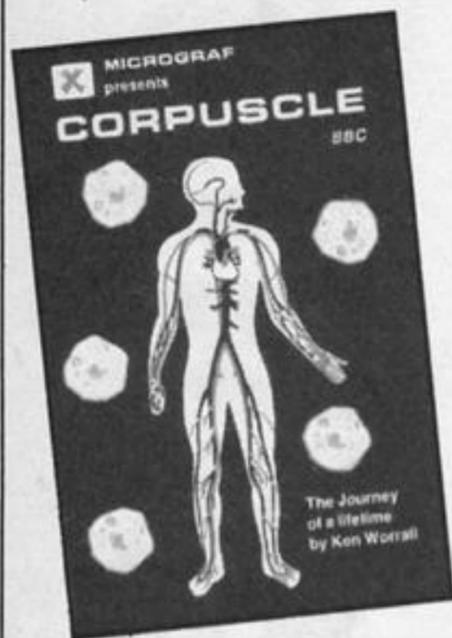
**Keen**



**Yawning**



**Comatose**



**Corpuscle**

After levering out the disc filing system chip, loading proceeded normally, accompanied by strains of "I've got you under my skin". Very whimsical when you realise that in this game, the objective is to float about in the blood-stream shooting germs.

You soon discover that by keeping the cross-hairs of your germ gun on the black hole in the centre of the screen and then holding down the fire button you can kill 'em all. However, in other tubules that you are not patrolling, the bacteria are lurking and multiplying and the germ count zooms up. If you follow the right blood vessels you can enter the body organs but with this particular bod — it's difficult to tell if you're in his feet or his lungs.

To help you find your way about, so that you can rush to a particular organ when there's a "germ alert", the cassette inlay provides a map of all the body's major blood vessels. It's all in Latin and reminds one of an Italian underground system.

Eventually of course, the germs win and your host dies. This is perhaps not such a bad thing, as with these lungs, he didn't have long left anyway.

**M.B.**

**Price:** £7.95

**Publisher:** Micrograf

**Address:** PO Box 17, Bracknell, Berks RG12 3NQ

**BBC**



**Ice Busters**

Ice Busters combines two arcade games into one. The first brings back memories of a Donkey Kong type of game — you must jump over snowballs and climb ladders to get to the top level before you can continue on to the second screen. It's a pity that they had to rip-off Donkey Kong instead of creating something original.

The next screen consists of lots of square blocks of ice through which there is a network of paths. The Snow Bees move around in their direction and crush them. This may sound easy but believe me — it isn't.

The graphics are nothing to get excited about and the general presentation could be better. There are versions of both these two games already available from other software houses, in my opinion Cascade Software seem to be re-inventing the wheel.

The instructions are very simple and straightforward, they assume that the player already knows what to do. I found that the F3 key will pause the game and the F1 will release it, the stop key is used to abort the current game. No mention of this was made on the inlay card though.

Play may be achieved using either the keyboard or a joystick. The game does not seem to use any turbo-loader although the inlay card claims that it does, I found the loading very unreliable and slow.

**K.I.**

**Price:** £6.95

**Publisher:** Cascade Games Ltd

**Address:** 1-3 Haywra Crescent, Harrogate, N Yorkshire HG1 5BG

**C64**



**Super Brat**

Atlantis claim Super Brat is the most authentic tennis game available for the Spectrum, yet only forehand shots from the baseline are possible!

Your player must take on Super Brat in the British final and if you succeed you move up to the European and the World finals — not even the competitions are realistic! Game controls are limited to left, right and swing your racket, there is no joystick option. To hit the ball to the left you must hit the ball quickly, hitting it slowly moves it to the right.

The background graphics of the umpire and line and net judges are excellent; the players are reasonable, though their legs are a rather odd shade of pink. There are irritating little tunes when a game is won, which can be switched off, and an excellent simulation of applause.

You can play three or five set matches and normal tennis rules apply, except the players don't change ends. You must be careful of conceding foot faults if you don't position your player correctly when serving. Some of the umpire's decisions seem odd but Super Brat usually remains calm, though he has been known to throw his racket down in disgust.

There is a slow response to the keys, and it's hard to spot the ball, making it difficult to get in line correctly, so this is a poor game to play.

Most authentic Spectrum tennis game? They cannot be serious!

**S.J.E.**

**Price:** £1.99

**Publisher:** Atlantis Software Ltd

**Address:** 19 Prebend St, London N1 8PF

**SPECTRUM**



**Davy — King of the Wild Frontier**

Imagine the scene; you're in the Wild West, the Indians are sending smoke signals between the hills while horse-drawn stage coaches pass along the roads. During the night the Indians took your cloths, rifle and girlfriend. The next morning you wake up and must collect your possessions while avoiding the oncoming arrows, lances, tomahawks, snakes, cacti and Indians.

The game is based upon a number of different screens. On each one you must collect a different article before you may continue onto the next. The background graphics are good although the foreground moving characters could do with a little more attention to detail — it's a pity they spoil the game.

One of the features that the game boasts is speech. Every now and again it keeps stopping play and saying something such as "Wild Indians". For some reason I cannot understand most of the words that it comes out with — perhaps I'm getting old and deaf! After a while you will get sick of listening to it and turn the sound down anyway so I don't suppose that this is much of a bad point.

I found the game was quite playable and despite all of the wrong key pressing and attempts to crash the program I will have to announce that it is bug-free.

The cassette cover claims fast loading of the program. I did not find it any faster than normal and it certainly did not use any special turbo-loader. Loading was not very reliable either.

**K.I.**

**Price:** £6.95

**Publisher:** Cascade Games Ltd

**Address:** 1-3 Haywra Crescent, Harrogate, N Yorkshire HG1 5BG

**C64**





**Hacker 2,000**

The scenario for this adventure, set in the year AD2,000, is that with your computer and RS232 interface lead, you have tapped into a broken data line, in an attempt to find and change your brain scan file. This will prevent the "thought police" catching you. However, penetrating the security system of the multivax computer is a difficult and complex task.

Loading was difficult as there was a glitch right through the tape and data blocks had to be obtained from both sides to achieve a load. The loading is accompanied by a rather weird rendering of Gustav Holst's "Mars". Very dramatic music to set the scene.

The usual adventure features are present, including a save game option. However, as one might expect, HELP is not provided. Interpretation of human input is limited to one or two words, the usual abbreviations applying.

I got in there hacking and managed to locate Rover V, an errant robot intent on blowing up multivax's EPROMs. He was quite useful until we encountered a security droid intent on blowing us up. This he achieved with consummate ease, exterminating Rover V and sending a high voltage surge down the line, killing me too!

In summary, I liked the concept of this adventure and the presentation created quite a dramatic atmosphere. The plot is a refreshing change from myth and magic. **M.B.**

**Price: £7.95**

**Publisher: Micrograf**

**Address: PO Box 17, Bracknell, Berks RG12 3NQ**

**BBC**



**The Train Game**

When loading, the program draws a random railway track layout, together with a few stations, trees and an engine shed. This procedure takes some considerable time and I suspect after several games, the fascination of seeing the computer feel its way around would be lost.

You start with one train which you have to control by changing points, stopping and reversing, with the objective of collecting passengers at one station and delivering them to another. In this way, you collect fares and make a profit, unless you happen to crash into the points when they are against you.

Just when you are finding things easy, another train is released from the shed and you must control them both. Other hazards to contend with are crashing into your own trains, running out of coal and demon trains. It's only a matter of time before panic sets in and there's an almighty crash.

The graphics are fair, coupled with a nice "chuff chuff" sound as the locos move round the track and the idea of the game is relatively novel. It is a multi-screen game, with an increasing degree of difficulty. If you've always wanted to be a train driver, here's your chance. **M.B.**

**Price: £7.95**

**Publisher: Micrograf**

**Address: PO Box 17, Bracknell, Berks RG12 3NQ**

**BBC**



**Fatty Henry**

With the limited ROM in the unexpanded VIC-20, it is quite a problem to create a game which is both novel and testing. This game appears to fill this role easily.

The scenario is rather bizarre. You play an octopus who is earmarked as the main course at a restaurant. You are dumped in an oven and must put out the flames at the bottom of the oven before the temperature reaches 100 degrees.

You do this by collecting droplets of condensation from the top of the oven and dropping them on the flames. Your efforts are impeded by pieces of flying food debris and a dog called Fatty Henry.

Collisions with flames, food or Henry cost you a life. There are a range of ovens with different layouts and hazards to complete.

The graphics are quite splendid with multicolour chunky figures. The octopus and Fatty Henry are built up from several characters to give pseudo sprites. The effect is enhanced with some reasonable animation.

Overall this is a challenging game which is colourful and quite a reasonable achievement on an unexpanded VIC. **A.W.**

**Price: £5.95**

**Publisher: Software Projects**

**Address: Bearbrand Complex, Allerton Rd, Woolton, Liverpool L25 7SF**

**VIC-20**



**DFM Database and Labels**

With these two well documented programs for the storing of data and printing of labels you can use your Amstrad as a filing cabinet, to store names, addresses, products, catalogues etc, as you choose. The machine holds one file at a time, each sheet in the file is a record, and each line in the record is a field. Via a series of menus, you declare your file structure, stating how many fields, and their size. DFM then tells you how many records can be accommodated. If you OK this, you then decide how you want the info presented on screen and printer, then enter the data.

You may then sort the file in alphabetical or ascending numerical order and retrieve the file you want using any field. Data can be saved to tape (there's no provision for discs) and loaded into the second program for label printing, in addition to presentation on screen.

The obvious comparison is Masterfile 464, which is £10 more, and which holds much more data, has many more facilities, and is easily transferred to disc. DFM is well written, but given modest programming skill, you could write it yourself. At £6.95 it would be worth having just to see how a database works, however, any serious user would be well advised to go for Masterfile. In the long run, it will save you time, temper and money if you buy the one which meets all your needs, present and future. **D.M.**

**Price: £14.95**

**Publisher: Amsoft**

**Address: 169 Kings Rd, Brentwood, Essex CM14 4EF**

**AMSTRAD**



NONTERRAQUEOUS



### Nonterraqueous

The aim is to guide the "seeker" through the insides of a mountain and destroy the base of an evil, tyrannical computer. Mastertronic say there are over 1000 screens to search.

Instead of a set amount of lives you are given a psyche level, the game ends when the level falls to zero. Colliding with an alien or the room-surround will reduce your psyche. In some rooms there is an object which boosts your psyche level, but some give you "decayed" psyche which is fatal. You can also die by running into a proton thruster, which is a white vertical line gradually increasing and decreasing in length.

Graphics are smooth and the three different rooms are much of a muchness since there are only a few static objects present in each and the same object can be found in many rooms.

Kempston, Protek and Sinclair joystick interfaces can be used, the keys are well chosen but cannot be redefined. Instructions are reasonable though there is little relation of the plot to the game.

In most rooms it is easy to avoid the proton thruster, provided you concentrate, but the different problems give the game its appeal — these include finding bombs to blow up force fields and obtaining fuel to power a rocket to take you through a gas room.

Once you have solved a problem the game seems easy — until the next is encountered, making Nonterraqueous a compulsive game and an excellent buy. **S.J.E.**

**Price:** £1.99

**Publisher:** Mastertronic

**Address:** Park Lorne, 111 Park Road, London NW8 7JL

**SPECTRUM**



LIVE OUT YOUR DREAMS

### ON THE SOUTHERN BELLE



### The Southern Belle

This is pretty amazing. It's a simulation of the London—Brighton run on a 1930's steam engine, and is possibly the most complex (and presumably realistic) simulations I've yet seen.

The screen display presents you with a view from the driver's position, and the landscape as you travel along the line is displayed using line-vector graphics. You have a time-table to keep to, and the various stations along your route, and major landmarks (tunnels and bridges etc.) make up the landscape graphics. These moving graphics are a little jerky, but very detailed, and the way that they seem to grow larger as you draw nearer is nicely done.

Controlling the train can be as simple or as complicated as you want, as there are an enormous range of control/difficulty options for you to choose from. You can, for instance, start off on a simple training run, during which you only have to worry about the brakes and a couple of simple controls, or you can go the whole hog and take total control of the train in a variety of conditions. This means that you can start off simply, but as you become more skilled, the game can become more difficult so that it will continue to present a challenge for some time to come.

It's difficult to do justice to such a richly complex game in a short review — it's probably for the arcade enthusiast, but if you are the kind of person attracted to the complexities of simulations, then I should think that this is a must. **C.J.**

**Price:** £7.95

**Publisher:** Hewson Consultants

**Address:** 7 Grahame Close, Blewbury, Oxon OX11 9QE

**SPECTRUM**



### Thing on a Spring

This is one of those games that are so addictive you cannot resist playing. On loading a nicely animated title page is displayed with a rather catchy tune playing in the background. You may start the game from here and use either the keyboard or the joysticks to play — the keys being totally user definable. There is also an option that will let you turn off/on the music and keep the special effects that are used in the game.

Your objective is to move Thing On A String through the factories and collect the nine pieces of a jigsaw. In the factories there are sinking floors, lifts, slides, etc. Wandering around are various strange objects that will drain your oil at a rapid rate. If your oil level gets too low then your spring will seize up and the game will inevitably end.

Between the screens there is a network of tunnels through which you must pass, in these you will find more oil draining creatures and obstacles in your way. At this stage you may also look at the jigsaw that you have so far completed.

The graphics are of an excellent quality; smooth scrolling, bright colours and imaginative designs have been used. To add variety to the game each screen contains different colours, designs and shapes each time you play.

Unfortunately the instructions are rather brief and lacking in detail. Apart from this it is an excellent game that I would strongly recommend. **K.I.**

**Price:** £7.95

**Publisher:** Gremlin Graphics Software

**Address:** Alpha House, 10 Carver St, Sheffield S1 4FS

**C64**



W S

### Chinese Patience



### Chinese Patience

You must pit your wits against the computer, in a desperate bid to get rid of all your cards. The winner scores points equal to the number of cards left in the loser's hand.

Each player is given 22 cards, the aces are used to start piles in which cards must be placed in suits in ascending order. The remaining four each form the start of piles in which cards must be placed in descending order with alternate colours.

You may twist the top card from your deck onto your discard pile, but you may only twist again in the same turn if you have moved the first "twisted card". As well as moving your own cards you can transfer cards from one pile to another to make space, and you can transfer a card to your opponents pile if it's in the same suit and of value immediately above or below the top card.

The computer moves quickly, although the card placing from stack to stack does. The beep signalling the movement of cards can get irritating, a different tone announces the end of the computer's move — so you can switch over to watch television while waiting! Another annoying feature is that you can type in your commands too quickly for the computer to understand.

To succeed — remembering to make all possible moves isn't enough — luck is essential! Nevertheless, "Chinese Patience" is an ideal choice if you enjoy trying your hand at cards. **S.J.E.**

**Price:** £1.99

**Publisher:** Atlantis Software Ltd

**Address:** 19 Prebend Street, London N1 8PF

**SPECTRUM**





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## 3B OR NOT 3B



**John Daddy put Voltmace's BBC joystick through its paces so read on and find out what he thinks!**

### **Delta 3b Single Joystick (MK11)**

Up until this morning's post arrived I had never been a very keen user of joysticks and felt much more comfortable using a keyboard to zap nasties or draw pictures, but today I had to revise my opinion.

Having used sniffer dogs and X-rays to check out a mysterious parcel left on my doorstep I finally unwrapped a Voltmace Delta 3b joystick and immediately fell in love with it. All together now, — ah!

The Voltmace Delta 3b has an uncluttered modern design

and the workmanship, (sorry! workpersonship), was excellent, both inside and out which gave it a precise and positive feeling. Another plus for me was the small joystick which could be held with finger and thumb, unlike many joysticks which feel like car gear levers. Being very patriotic, I was also delighted to see that it was British made.

The joystick casing is made from nylon and should be almost indestructible. The shaft is steel set in a ball and socket joint which actuates two firmly positioned potentiometers set at right angles to each

other, one for sensing the left to right movement and the other for sensing the up and down movement of the joystick. It has a strong and very quick self-centring action which is obtained by a simple mechanism actuated by four small springs.

The potentiometers produce an analogue signal which represents the position of the joystick and if it wasn't for the strength of the springs, which make it difficult to hold the position of the cursor on the screen, the Delta 3b would be an ideal choice for graphics software control.

In the top panel of the case, just below the joystick, there are two red buttons which act as fire buttons and below these is set a further green button. Pressing these buttons in different sequences, and checking the value of ADVAL(0)

AND 3, the following readings can be obtained.

- No buttons pressed — ADVAL 0 AND 3 = 0
- Either one of the red buttons pressed — ADVAL 0 AND 3 = 1
- The green button pressed — ADVAL 0 AND 3 = 2

The horizontal position of the joystick can be read from ADVAL 1 or ADVAL 3.

The vertical position of the joystick can be read from ADVAL 2 or ADVAL 4.

This gives the user the opportunity to write software which will enable the keyboard key functions in games to be controlled by the joystick keys and should save games players much of the frustration of searching for the correct key on the keyboard at some desperate point in a game.

The two fire buttons, positioned at either side of the top face of the case, make this joystick an ideal choice for left handers. Designers often condemn left handed people to a

life of "Cross Hand Boogy", and not only joystick designers.

For lazy programmers Voltmace produce a joystick utility which will convert some non joystick games to work with twin or single joysticks. The instructions for the joystick suggests that the software is user friendly and says that it will work with single or twin joysticks, but unfortunately this tape was not sent for review along with the unit. The program is said to allow any key function to be replaced by the joystick direction, and its sensitivity can be altered, so

that the amount of movement required to simulate a key press can be changed.

Also included is a rapid fire feature which enables a continually depressed key to simulate repeated pressing of the fire button; a boon to games players like myself who are often so absorbed in trying to position the source of the projectile that they forget to pull the trigger.

The Delta 3b will run any Acornsoft, or Acornsoft compatible, software written for a single joystick or games which do not require players to use a joystick each. For games which do require both players to play at once a Delta 3b twin is available. It is compatible with BBC machines fitted with the A/D interface, or Electrons fitted with a Plus 1 interface.

Overall I was very impressed with this unit and it is especially good value for money. A one year guarantee is given against faulty workmanship or parts

but I don't think Voltmace will have to worry about many dissatisfied customers knocking at their doors. Some joysticks I have tested have been badly engineered and inaccurate but this Voltmace product is well engineered in all respects and should prove to be very reliable.

J.H.D.

Price: £11.95

Publisher: Voltmace Ltd

Address: Park Drive, Baldock, Herts SG7 6EV

Machine: BBC Model B, Model A with A/D port and Electron with Acorn Plus 1 interface



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# BEGINNING MACHINE CODE

**Using your bits of your bytes as flags is the subject of this week's machine code tutorial from Diana and Colin Smith**

**T**his week we are going to cover those Z80 instructions which allow us to manipulate the eight bits which make up each byte.

The simplest are the BIT, SET and RES instructions which are used to test, set or reset a bit (0-7) of the A, B, C, D, E, H or L registers or (HL).

BIT 0,A tests bit zero of the A register. If the bit is *reset* (0), the flag will be *set*. However, if the bit is *set* (1), the zero flag will be *reset*. The BIT instruction is therefore normally followed by a conditional instruction like JR Z,n.

The SET instruction ensures that a stipulated bit is *set* and likewise RES ensures that a stipulated bit is *reset*.

e.g. SET 3,A  
RES 5,A

You can use these instructions to create your own "flags". Reserve a byte at an address held in the HL register pair. The eight bits of that byte can now be used as separate flags in your own routines. They could indicate that a figure had jumped, fallen, turned around or run off with the girl next door!

The BIT instruction is often used when reading the keyboard to check which particular key has been pressed. We will see an example of this in the next article, when we cover the machine code IN instruction. In the meantime, you may like to read up about the BASIC IN instruction in your Spectrum manual.

The rest of this week's article is devoted to the rotation and shift instructions. These are used to move the bits of a byte and all the examples we will cover also involve the carry flag.

These instructions operate on the single registers and (HL). Listing 1 is a short routine to produce the mirror image of a character, in this case, a reversed "B".

Listing 1

30000	LD	HL,65376	33
			96
			255
30003	LD	B,8	6
			8
30005	L1	PUSH BC	197
30006		XOR A	175
30007		LD B,8	6
			8
30009	L2	RRC (HL)	203
			14
30011		RLA	23
30012		DJNZ L2	16
			251
30014		LD (HL),A	119
30015		INC HL	35
30016		POP BC	193
30017		DJNZ L1	16
			242
30019		LD A,2	62
			2
30021		CALL 5633	205
			1
			22
30024		LD A,145	62
			145
30026		RST 16	215
30027		RET	201

The routine uses two rotation instructions which allow us to use the carry flag to transfer information from one byte to another. Refer to Fig.1 which should make the following explanation clearer.

HL is loaded with the address of the first byte of Graphic B — 65376 for the 48K Spectrum. For eight bytes of the character, the A register is set to zero by

XOR A and we enter the second loop. The instruction RRC (HL), (Rotate Right with Carry, the byte addressed by HL) takes bit 0 of the byte addressed by HL and copies it to the carry flag. All the bits move one place to the right with the original value of bit 0 going to bit 7.

The instruction RLA, (Rotate Left the A register) copies the value of the carry

Listing 2

30000	LD	HL,16384	33
			0
			64
30003	LD	B,192	6
			192
30005	L1	PUSH BC	197
30006		AND A	167
30007		LD B,32	6
			32
30009	L2	RR (HL)	203
			30
30011		INC HL	35
30012		DJNZ L2	16
			251
30014		POP BC	193
30015		DJNZ L1	16
			244
30017		RET	201

flag to bit 0 of A, moves all the bits one place to the left and the original value of bit 7 goes to the carry flag.

After eight such repetitions, the byte addressed by HL has regained its original form and the A register contains its mirror image. The LD (HL),A instruction replaces the original form of the byte with its mirror image and INC HL moves us on to the next byte.

If you are feeling adventurous, you could modify the code so that the mirror image is transferred to another User Defined Graphic character. The remaining code tells the Spectrum to print the new Graphic B on the screen.

Use an assembler or the loader program given in the first article of this series to load the code of Listing 1, starting at address 30000. Run the routine with RAND USR 30000 to see your reversed Graphic B.

As you might expect by now, the Z80 instruction set also provides instructions which work in the opposite direction to the two used in our example. Fig.2 shows the RLC (Rotate Left with Carry) and the RR (Rotate Right) instructions which complement, respectively, the RRC and RL instructions in the example given.

As a bonus, Listing 2 provides a routine to scroll the screen one pixel to the right. Print something on the screen, then try calling the routine with the Basic line

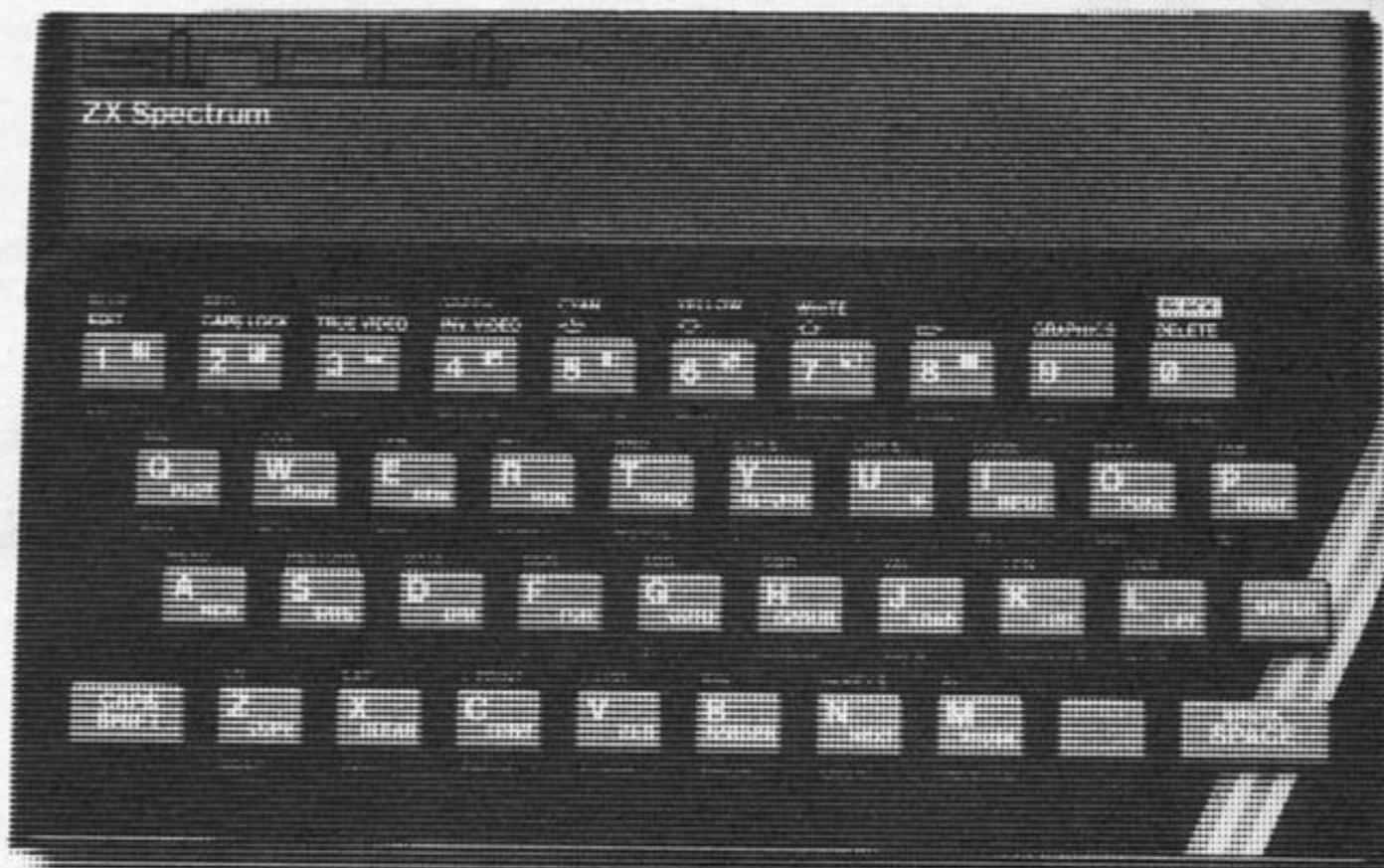
```
FOR n=1 TO 256: RAND USR 30000: NEXT n
```

You should be able to understand how the routine works for yourself by now. Note that 16384 is the first byte of screen memory.

To finish off, we will look at two shift instructions. SLA or Shift Left moves all the bits one place to the left with bit 0 being reset and the original bit 7 going to the carry flag. This has the effect of multiplying the byte value by two, provided there is no overflow to the carry flag, i.e. the original number was less than 128.

SRL or Shift Right Logical moves all the bits one place to the right with the original bit 0 going to the carry flag. Bit 7 is reset and this has the effect of halving the original byte value.

These instructions are illustrated in Fig.3.



In the next article we will look at the IN's and OUT's of machine code or reading the keyboard and driving the loud-speaker with machine code routines.

Fig. 1. Rotation instructions RRC and RL

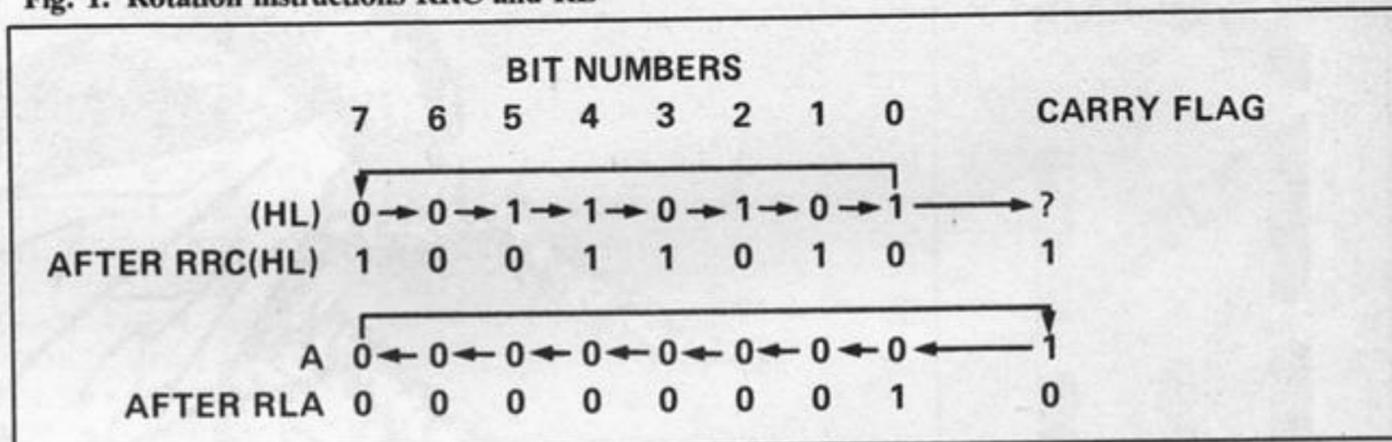


Fig. 2. Rotation instructions RLC and RR

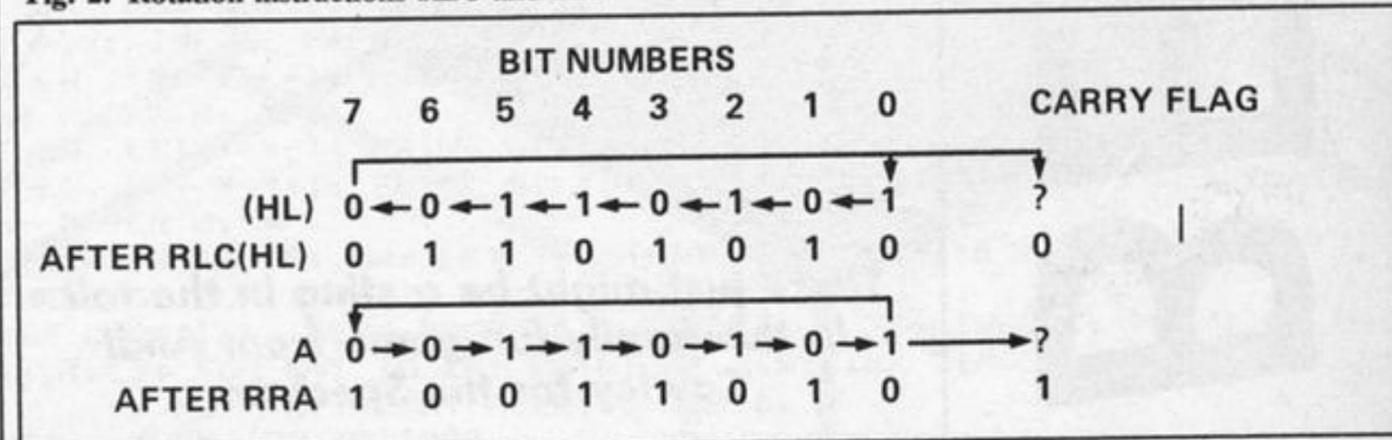
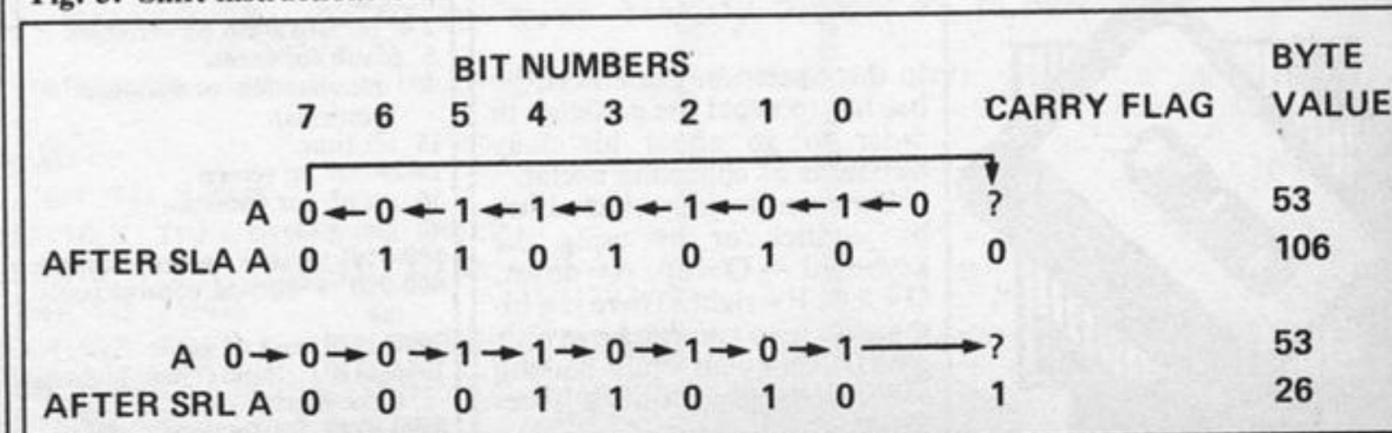
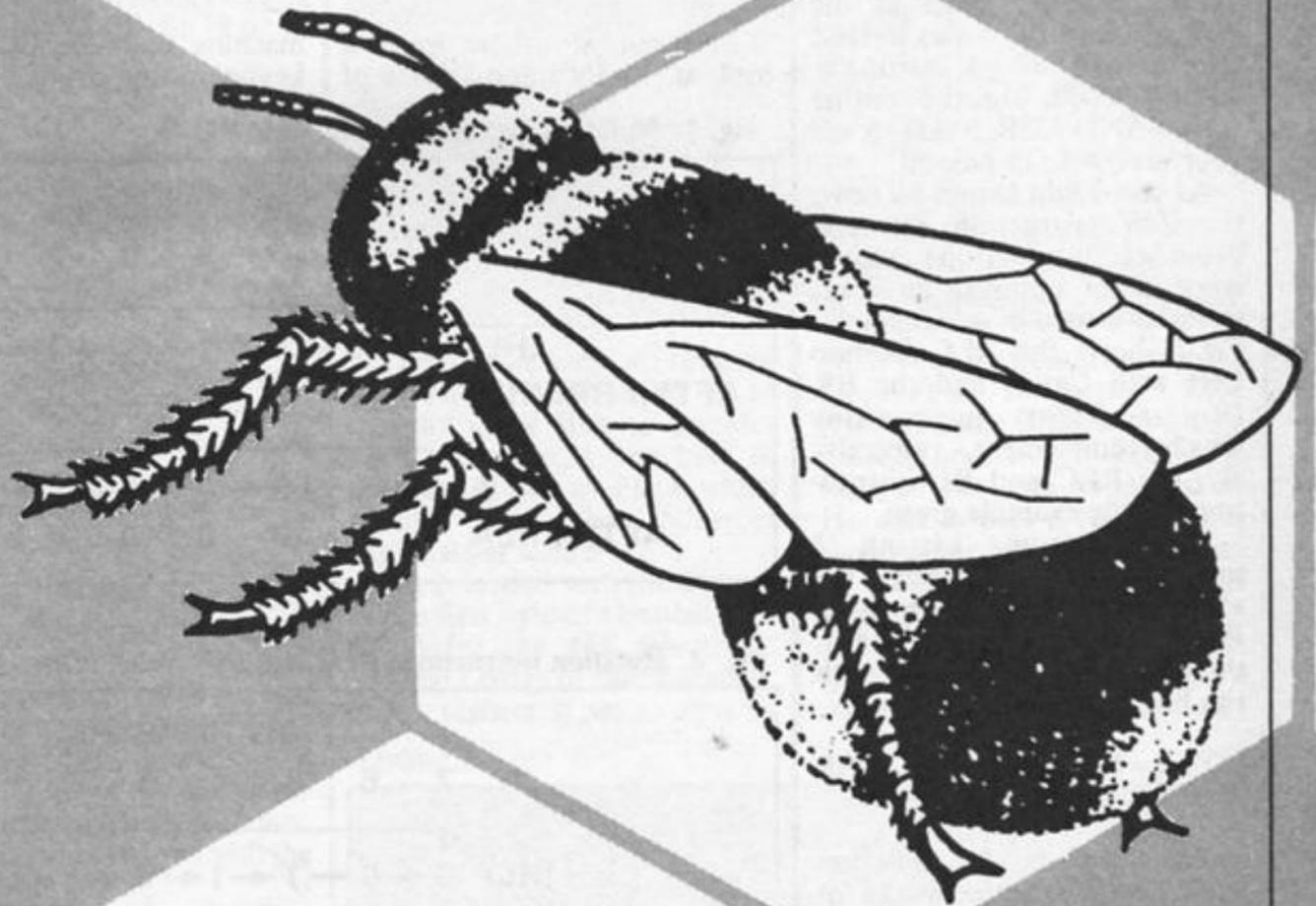
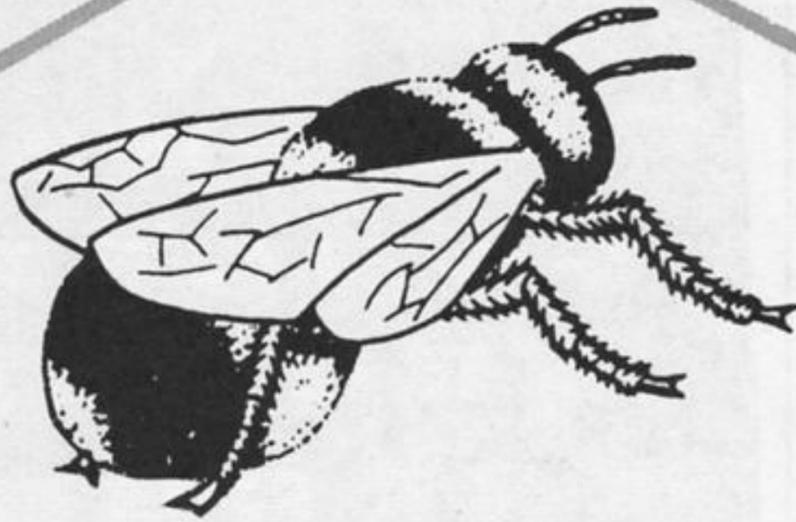


Fig. 3. Shift instructions SLA and SRL



SPECTRUM GAME

# BEEZY BEE



*There just might be a sting in the tail in this family-fun game from Andi Cowley for the Spectrum*

In this Spectrum game Bert the bee has to avoid the gardener in order to go about his daily buzziness of collecting nectar.

Bert can be controlled either by joystick or by using the keyboard — Q=up, A=down, O=left, P=right. There is a hi-score table so you can keep your own pollen-count whilst making sure the gardener ain't misbehivin'.

#### How it works

0 save  
 2-4 initialisation of variables  
 5 gosub for menu  
 10 initialisation of variables (controls)  
 15 set timer  
 16-25 set up screen  
 30 gosub for controls  
 40 change level  
 800-910 joystick control routine  
 900-990 keyboard control routine  
 1000-1010 end of game  
 1015-1110 input/view highest three scores  
 8500-8740 instructions

#### Variables

CON control routine  
 HS highest scorers name  
 JS second highest scorers name  
 JS third highest scorers name  
 HS highest score  
 HS2 second highest score  
 HS3 third highest score  
 GAME points  
 SC score  
 TS title block  
 LIVES lives remaining  
 X,Y x,y, coordinates of the man  
 LE,ES graphics  
 LEVEL level  
 M counts no. of objects  
 N general purpose  
 IS instructions  
 SS speech system

N.B. T\$ is made up of 32 blank spaces

```

1 SAVE "BEEZY" LINE 9999: VERIFY "BEEZ": BORDER 0: PAPER 0: CLS : INK 7
2 POKE 23607,123: LET CON=900: PAPER 0: BORDER 0: INK 7: CLS : LET H$="A.C":
LET HS=7075: LET HS2=2025: LET HS3=1100: LET N$="A.J": LET J$="DAD": PRINT AT 11
,7: FLASH 1;" WRITTEN BY AC "
3 LET GAME=50: LET a=1: FOR n=0 TO 10: BEEP a,5: LET a=a-.1: NEXT n
4 LET t$="
5 CLS : GO SUB 9000
10 POKE 23658,8: LET SC=0: LET LIVES=3: LET X=1: LET Y=0:
11 LET le=36
12 LET e$=CHR$ le
13 LET LEVEL=2
15 FOR N=23674 TO 23672 STEP -1: POKE N,0: NEXT N: LET T=INT (65536*PEEK 23674
+256*PEEK 23673+PEEK 23672)/50: FOR M=0 TO 7: LET A=INT (RND*20+1): LET B=INT (R
ND*32): PRINT AT A,B: INK 6; BRIGHT 1;":""
16 IF SC>950 AND SC<1050 THEN LET LIVES=LIVES+1: BEEP .01,10
20 PRINT AT 0,0:T$:AT 0,12: INK 2; PAPER 7;"SCORE";AT 0,18;SC
25 PRINT AT 21,0:T$:AT 21,12: INK 1; PAPER 7;"LIVES";AT 21,18:LIVES
30 GO SUB CON: NEXT M
40 CLS : FOR N=0 TO 10: FOR I=0 TO 7: PRINT AT 11,8: INK 1;"ENTER LEVEL ";LEVE
L: BEEP .007,50: NEXT I: NEXT N: LET GAME=GAME+25: LET SC=SC-INT T: LET LEVEL=LE
VEL+1: CLS : LET le=le+1: GO TO 15
800 REM *****JOYSTICK*****
801 PRINT AT X,Y: INK 6; PAPER 0;"#"
802 PRINT AT A,B: INK 6; PAPER 0: BRIGHT 1;":""
803 IF X=A AND Y=B THEN BEEP .01,50: LET SC=SC+GAME: RANDOMIZE : RETURN
804 IF IN 31=8 THEN LET X=X-1: PRINT AT X+1,Y;" ": IF X<=1 THEN LET X=1: PRIN
T AT X+1,Y;" ";AT X,Y: INK 6; PAPER 0;"#"
805 IF IN 31=4 THEN LET X=X+1: PRINT AT X-1,Y;" ": IF X>=20 THEN LET X=20: PR
INT AT X,Y: INK 6; PAPER 0;"#"
806 IF IN 31=2 THEN LET Y=Y-1: PRINT AT X,Y+1;" ": IF Y<=0 THEN LET Y=0
807 IF IN 31=1 THEN LET Y=Y+1: PRINT AT X,Y-1;" ": IF Y>=31 THEN LET Y=31: PR
INT AT X,Y: INK 6; PAPER 0;"#"
808 IF X=A AND Y=B THEN BEEP .01,50: LET SC=SC+GAME: RANDOMIZE : RETURN
809 IF SCREEN$ (X,Y)=(CHR$ le) THEN BEEP .01,-9: LET LIVES=LIVES-1: PRINT AT 2
1,18; PAPER 7; INK 1;LIVES: FOR N=1 TO 20: PRINT AT N,0 INK 0;"
": NEXT N: PRINT AT A,B: INK 6; B
RIGHT 1;":"" : IF LIVES=0 THEN GO TO 1000
810 PRINT AT INT (RND*20+1),INT (RND*32);CHR$ le: GO TO 800
900 REM *****CONTROLS*****
901 PRINT AT X,Y: INK 6; PAPER 0;"#"
902 IF X=A AND Y=B THEN BEEP .01,50: LET SC=SC+GAME:: RANDOMIZE : RETURN
905 IF INKEY$="M" THEN GO SUB 1100
910 IF INKEY$="Q" THEN LET X=X-1: PRINT AT X+1,Y;" ": IF X<=1 THEN LET X=1: P
RINT AT X+1,Y;" ";AT X,Y: INK 6; PAPER 0;"#"
920 IF INKEY$="A" THEN LET X=X+1: PRINT AT X-1,Y;" ": IF X>=20 THEN LET X=20:
PRINT AT X,Y: INK 6; PAPER 0;"#"
940 IF INKEY$="D" THEN LET Y=Y-1: PRINT AT X,Y+1;" ": IF Y<=0 THEN LET Y=0
950 IF INKEY$="P" THEN LET Y=Y+1: PRINT AT X,Y-1;" ": IF Y>=31 THEN LET Y=31:
PRINT AT X,Y: INK 6; PAPER 0;"#"
960 IF X=A AND Y=B THEN BEEP .01,50: LET SC=SC+GAME: RANDOMIZE : RETURN
970 IF INKEY$="M" THEN GO SUB 1100
980 IF SCREEN$ (X,Y)=(CHR$ le) THEN BEEP .01,-9: LET LIVES=LIVES-1: PRINT AT 2
1,18; PAPER 7; INK 1;LIVES: FOR N=1 TO 20: PRINT AT N,0; INK 0;"
": NEXT N: PRINT AT A,B: INK 6;
BRIGHT 1;":"" : IF LIVES=0 THEN GO TO 1000
990 PRINT AT INT (RND*20+1),INT (RND*32);CHR$ le: GO TO 900
1000 LET LIVES=3: FOR N=1 TO 20: PRINT AT N,0; INK 2; PAPER 7; FLASH 1;"
": NEXT N
1010 PRINT AT 11,4; PAPER 2; INK 7; FLASH 1;" THE GARDENER GO! YOU ": BEEP 1,5
0: BEEP .75,60
1015 CLS : LET GAME=50:
1016 IF SC<HS3 THEN GO TO 1050
1017 IF SC>HS3 AND SC<HS2 THEN GO TO 1020
1018 IF SC>HS2 AND SC<HS THEN GO TO 1030
1019 IF SC>HS THEN GO TO 1040
1020 IF SC>HS3 AND SC<HS2 THEN INPUT "WELL DONE YOU HAVE TODAYS THIRD HIGHEST S
CORE.PLEASE ENTER YOUR NAME (<3 LETTERS)"; LINE J$: IF LEN J$>3 THEN LET J$="":
GO TO 1020

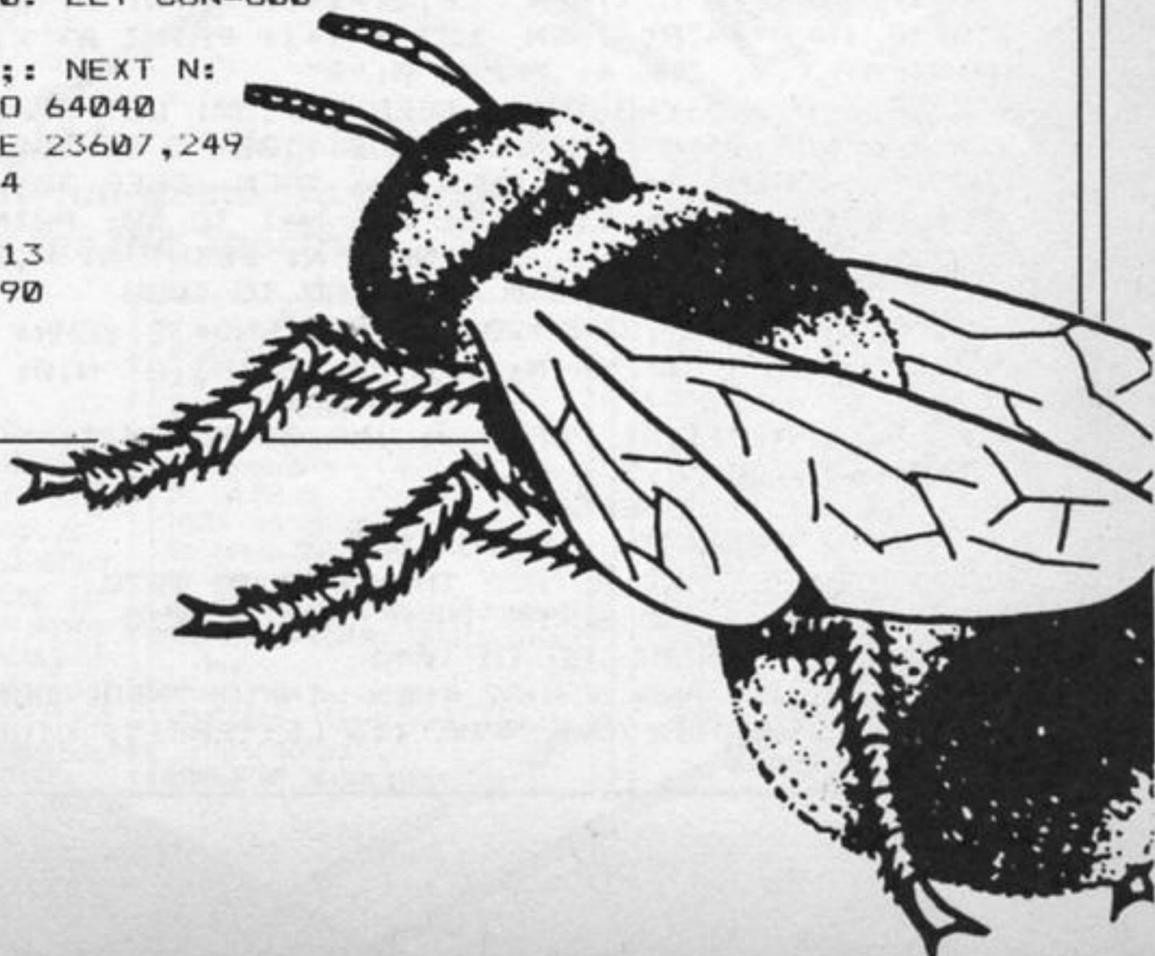
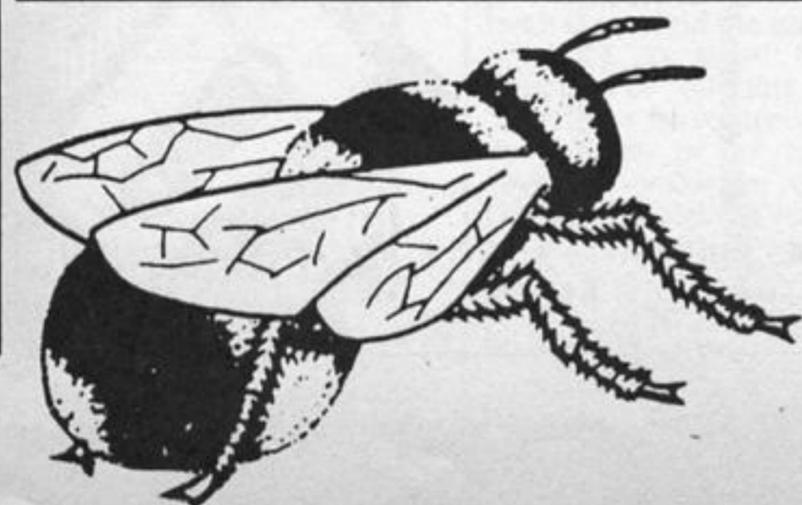
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# P R O G R A M

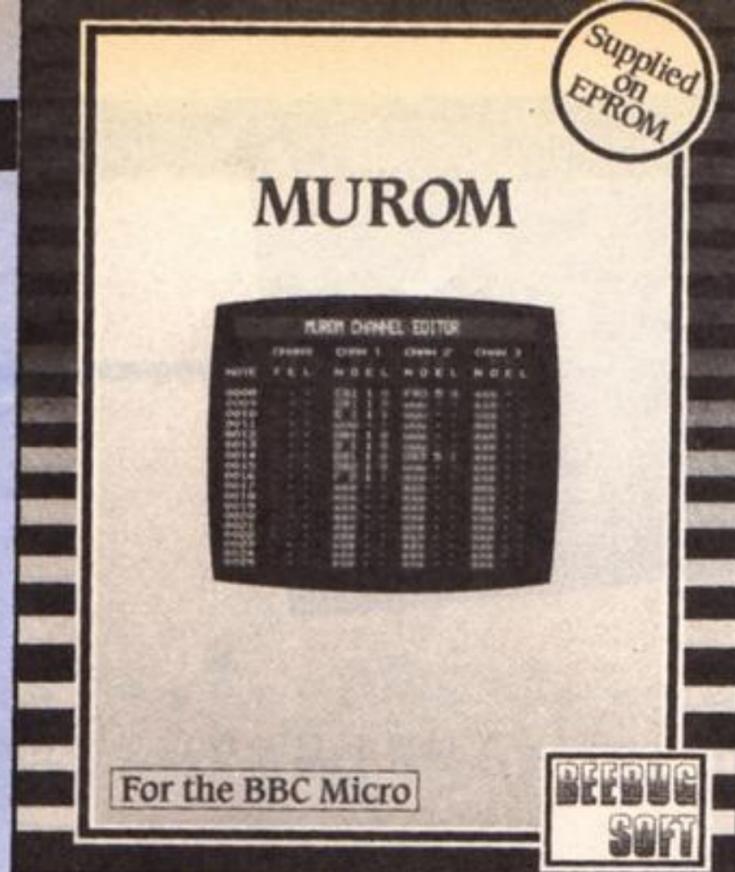
```

1025 LET HS3=SC
1029 GO TO 1050
1030 IF SC>HS2 AND SC<HS THEN LET J#=N#: INPUT "WELL DONE YOU HAVE TODAYS SECON
D HIGHEST SCORE.PLEASE ENTER YOUR NAME {3 LETTERS}"; LINE N#: IF LEN N#>3 THEN
GO TO 1030
1035 LET HS3=HS2: LET HS2=SC
1039 GO TO 1050
1040 IF SC>HS THEN FOR N=40 TO 60 STEP 2: BEEP .004,N: NEXT N: LET J#=N#: LET N
#=H#: INPUT "WELL DONE YOU HAVE TODAYS BEST SCORE.PLEASE ENTER YOUR NAME {3 LETT
ERS}"; LINE H#: IF LEN H#>3 THEN GO TO 1040
1045 LET HS3=HS2: LET HS2=HS: LET HS=SC
1050 BEEP .1,40: FOR N=0 TO 50: FOR I=0 TO 5: PRINT AT 2,10: INK 1;"TODAYS GREAT
EST"
1054 IF INKEY#<>" " THEN CLS : GO TO 9000
1055 PRINT AT 5,8: INK 1; BRIGHT 1;H#;" WITH ";HS;AT 10,8: INK I+1;N#;" WITH ";H
S2;AT 15,8: INK I+2;J#;" WITH ";HS3: NEXT I: NEXT N: CLS : GO TO 9000
1100 REM
1105 BEEP .09,10: PRINT AT X,Y+1;" ":
1110 RETURN
8500 REM *****INSTRUCTIONS*****
8510 PRINT AT 1,12;"BEEZY": LET I#=" HI MY NAME IS BERT THE BUMBLE BEE AND I'VE
GOT A PROBLEM.YOU SEE THE GARDENER HAS TRAPPED ME AND SEI ME AN IMPOSSIBLE TAS
K...I MUST COLLECT THE NECTAR FROM EACH OF THE FLOWERS,THATS EASY BUT THE GARD
ENER WILL DROP .....IF ANYONE CAN HELP ME YOU CAN"
8700 PRINT AT 4,0;: FOR N=1 TO LEN I#: BEEP .003,60: PRINT I$(N);: NEXT N
8710 PRINT AT 21,0: FLASH 1;" PRESS ANY KEY "
8715 IF INKEY#=" " THEN GO TO 8710
8720 CLS : LET I#="TO MOVE BERT '# AROUND THE SCREEN USE Q=UP A=DOWN
O=LEFT P=RIGHT"
8725 PRINT AT 4,0;: FOR N=1 TO LEN I#: BEEP .003,60: PRINT I$(N);: NEXT N
8730 PRINT AT 21,0: FLASH 1;" PRESS ANY KEY "
8735 IF INKEY#=" " THEN GO TO 8730
8740 CLS
9000 PRINT AT 0,0;t#:AT 0,14: INK 1; PAPER 7;"BEEZY"
9005 FOR n=1 TO 13: PRINT AT n,0: INK 1;" ":AT n,30: INK 1;" ": NEXT n
9010 PRINT AT 13,0;t#
9015 BEEP .1,15: PRINT AT 2,5: INK 2; PAPER 7; FLASH 1;"1.INSTRUCTIONS": BEEP .1
,10: PRINT AT 4,5: INK 2; PAPER 7; FLASH 1;"2.START GAME": BEEP .1,5
9016 PRINT AT 6,5: INK 2; PAPER 7; FLASH 1;"3.KEMPSTON": BEEP .1,0
9017 PRINT AT 8,5: INK 2; PAPER 7; FLASH 1;"4.KEYBOARD": BEEP .1,-5
9020 FOR N=0 TO 500: PLOT RND*255,RND*50: BEEP .01,RND*10+40
9040 IF INKEY#="2" THEN LET S#="(B)(EE)(S)EE": POKE 23692,255: FOR n=0 TO 37: P
RINT : NEXT n: GO TO 6
9045 IF INKEY#="4" THEN BEEP .1,30: LET CON=900
9050 IF INKEY#="1" THEN POKE 23692,255: FOR n=0 TO 36: PRINT : NEXT n: GO TO 85
00
9052 IF INKEY#="3" THEN BEEP .1,30: LET CON=800
9055 NEXT N: CLS : GO TO 1050
9900 FOR N=32 TO 255: PRINT CHR# N;: NEXT N:
9905 POKE 23607,150: FOR N=64008 TO 64040
9910 READ a: POKE n,a: NEXT n: POKE 23607,249
9915 DATA 80,40,20,39,126,188,16,64
9920 DATA 128,192,112,20,26,2,3,1
9925 DATA 6,11,30,60,124,238,231,213
9930 DATA 0,0,126,219,255,153,153,90
9950 LOAD "CHARS"CODE : GO TO 2
9998 REM currah u-speech
9999 LET S#="(B)(EE)(S)EE"

```



# REVIEW



## Dave Reeder lends an ear to music on the BBC with Beebug's MUROM. Read on to find out why he was impressed

In common with most Beeb users, I've never really come to terms with its music capabilities. The variety and depth of its sound channels and parameters mean that even moderately complex musical arrangements can reduce the average user to a state of gibbering insensibility all too quickly.

All of which is to say the least, a waste. As tools to be exploited, the SOUND and ENVELOPE commands deserve special notice, and an ever-increasing number of music add-ons, such as the MIDI explosion, compete for our attention and our money.

Enter Beebug — with MUROM and a promise that with it, you will be able to exploit the Beeb's sound potential to the full. The package itself looks promising — an 8K ROM (version 1.20 under review), a demo cassette of music data files, a quick summary function card and yet another function key strip to misplace.

So, to work! Two minutes with a screwdriver and the ROM's in place, ready to be called from within BASIC (note that there is a possibility of workspace corruption if called from another language) with one of four possible variations of the command SCORE. or directly by MUROM.

### The Editor

Calling MUROM defaults to the Music Editor (a cold start) with 4K of memory reserved above the existing page — this allows up to 341 notes per channel, but the workspace area can be easily altered if you wish. The initial screen display is clearly laid out: four channels, note numbers and a selection of

toggle displays between horizontal or vertical editing modes, playback status and note entry details. Virtually every command can be entered with either a single keypress or combination of Shift, Control and Keypress.

The four channels (three music and one white sound) can be filled with notes using the cursor keys and, although rests are entered automatically, there is no bar entry. A simple colour marking of every eighth note helps though as bars are usually four, eight or 16 beats. Each note can be entered by channel (0-3), octave (0-5), envelope (1-16) and length. The editor's ease of use is amazing once the basic techniques are grasped. The music entry becomes fast and accurate — especially with copy techniques, transposing modes, optional harmonies, letter or keyboard entry and so on. Music data can also be loaded to and from disc or cassette.

### Star Commands

As well as \*SCORE mentioned above, there are a variety of star commands which can be used outside MUROM (as long as the ROM is present in the machine!):

**\*PLAY** — This obviously plays the data you have entered, but is interrupt driven so that you can hear your masterpiece whilst running a program, printing or even loading from cassette.

**\*TEMPO** — 15 tempos are available and the speed of music playback can be changed even whilst music is playing!

**\*HARM** — Not a true harmony, but this does produce quite a pleasing effect and is especially useful in providing a basis for your own more precise harmonies.

**\*MUTE** — Instant stop to any music playing.

**\*MONO/\*COLOUR** — The Music Editor can be in either colour or monochrome, depending on your TV/monitor,

### Envelope Editor

The other main part of the utility is a display enabling you to define up to 16 envelopes. Again, the editing is simple — it needs to be! As you'll know, the following parameters of the Beeb's envelopes can be defined: Attack, Decay, Sustain, Release, Level and Decay Level, with possible value ranges of 0 to 127. Anything that simplifies such a complex system is to be welcomed, and when it is as clear as MUROM's display, it is doubly so.

MUROM also includes a selection of pre-defined envelopes (\*PIANO, \*FLUTE, \*DRUM, and others which can be used both in your own programs and within the Music Editor. And, to complete the package, a range of instant sound effects for game use such as \*ZAP (spaceship laser) or \*TRIM (trim phone).

### Getting Technical

The demo tape included in the utility shows in 11 selections just how effective the Beeb's music capability can be, from Bach's "Anna Magdalena" to Madness' "My Girl"! My litmus test for music packages is to try and key in Scott Joplin's "The Entertainer" (theme from "The Sting") — usually I collapse in despair but MUROM handled it like a dream. Its 10 note value and five octave range (two octaves either side of middle C) made light work of multi-octave syncopation.

In short, this is an excellent utility. I recommend it highly, but with one small word of caution — the more you understand and can read music, the more you'll get out of MUROM. Well done, Beebug!

D.R.

Price: £29.00

Supplier: Beebugsoft

Address: PO Box 50, St Albans, Herts

BBC



# MUSIC AND THE MICRO



If you have ever puzzled over the note to number conversions required to play music on your micro pull out and keep Clive Gifford's chart

NOTE SPECTRUM AMSTRAD BBC/ELECTRON COMMODORE 64 ORIC/ATMOS DRAGON 32

High Low

NOTE	SPECTRUM	AMSTRAD	BBC/ELECTRON	COMMODORE 64	ORIC/ATMOS	DRAGON 32
C	-12	956	5	8	97	02 C
C#	-11	902	9	8	225	02 C#
D	-10	851	13	9	104	02 D
D#	-9	804	17	9	247	02 D#
E	-8	758	21	10	143	02 E
F	-7	716	25	11	48	02 F
F#	-6	676	29	11	218	02 F#
G	-5	638	33	12	143	02 G
G#	-4	602	37	13	78	02 G#
A	-3	568	41	14	24	02 A
A#	-2	536	45	14	239	02 A#
B	-1	506	49	15	210	02 B
C	0	478	53	16	195	03 C
C#	1	451	57	17	105	03 C#

Here is a handy guide to making music on all the popular home computers. This table gives the equivalent values of a note for the Spectrum, Amstrad, BBC/Oric/Atmos, Commodore 64, and Dragon 32 computers. If you see a program containing a tune for another computer, in Home Computing Weekly or anywhere else, then with this guide you can convert that tune to play on your own machine.

D	2	426	61	18	209	03 D	03 D
D#	3	402	65	19	239	03 D#	03 D#
E	4	379	69	21	31	03 E	03 E
F	5	358	73	22	96	03 F	03 F
F#	6	338	77	23	181	03 F#	03 F#
G	7	319	81	25	30	03 G	03 G
G#	8	301	85	26	156	03 G#	03 G#
A	9	284	89	28	49	03 A	03 A
A#	10	268	93	29	223	03 A#	03 A#
B	11	253	97	31	165	03 B	03 B
C	12	239	101	33	135	04 C	04 C
C#	13	225	105	35	134	04 C#	04 C#
D	14	213	109	37	162	04 D	04 D
D#	15	201	113	39	223	04 D#	04 D#
E	16	190	117	42	62	04 E	04 E
F	17	179	121	44	193	04 F	04 F
F#	18	169	125	47	107	04 F#	04 F#
G	19	159	129	50	60	04 G	04 G
G#	20	150	133	53	57	04 G#	04 G#
A	21	142	137	56	99	04 A	04 A
A#	22	134	141	59	190	04 A#	04 A#
B	23	127	145	63	75	04 B	04 B

BBC GAME

There's only one survivor after this gun duel to the finish. The loser books in permanently at the underground hotel on Boot Hill. So sit down for a showdown with Stephen Gray's game for the BBC

# BOOT HILL



Play the roles of Buffalo Bill and Big Bad Tom in this western shootout game for two players. The first gunfighter to score five hits wins the game and is declared the greatest gunslinger in the West.

#### Controls

Bill up — caps lock, down — shift lock, fire — Z  
Tom up — return, down — delete, fire — /

#### Variables

B% hits by Bill  
T% hits by Tom  
H has someone been hit?  
BY% Bill's y coordinate  
MY% Bill's last y coordinate  
J% has anyone moved?  
BF% has Bill fired?  
GX%,GY% Bill's bullet's coordinates  
GS Bill's bullet  
BS Bill  
TY% Tom's x coordinate  
SY% Tom's last x coordinate  
TF% has Tom fired?  
PX%,PY% Tom's bullet coordinates  
PS Tom's bullet  
TS Tom  
CS cross  
FS Yellow block

#### How it works

80-140 initialisation  
150-200 main loop  
210-310 Bill subroutine  
320-420 Tom subroutine  
430-450 Bill's bullet subroutine  
460-480 Tom's bullet subroutine  
490-660 instructions and initialisation subroutine  
670-740 set up screen subroutine  
750-790 someone was hit subroutine  
800-870 end of game



```

10 REM
20 REM   Boot hill
30 REM   By Stephen Gray
40 REM   BBC Model B
50 REM   For H.C.W.
60 REM   Grayface
70 REM
80 ON ERROR RUN
90 MODE 7
100 PROCINIT
110 B%=0:T%=0
120 IF B%=5 OR T%=5 GOTO 800
130 MODE 5:VDU 5
140 PROCSCREEN
150 REM **** Main loop ****
160 PROCTOM
170 IF H<>0 GOTO 120
180 PROCBILL
190 IF H<>0 GOTO 120
200 GOTO 160
210 DEF PROCBILL:MY%=BY%:J%=0
220 IF BF%=1 PROCBFIRE
230 IF BF%=1 PROCBFIRE
240 IF BF%=1 PROCBFIRE:ENDPROC
250 IF INKEY(-81) AND BY%>96 BY%=BY%-32:J%=1
260 IF INKEY(-65) AND BY%<900 BY%=BY%+32:J%=1
270 IF INKEY(-98) AND BF%=0 BF%=1:GY%=BY%-32:GX%
=228:MOVE GX%,GY%:PRINTG$:SOUND 0,-15,6,2
280 IF J%=0 ENDPROC
290 MOVE 100,MY%:PRINTB$
300 MOVE 100,BY%:PRINTB$
310 ENDPROC
320 DEF PROCTOM:SY%=TY%:J%=0
330 IF TF%=1 PROCTFIRE
340 IF TF%=1 PROCTFIRE
350 IF TF%=1 PROCTFIRE:ENDPROC
360 IF INKEY(-90) AND TY%>96 TY%=TY%-32:J%=1
370 IF INKEY(-74) AND TY%<900 TY%=TY%+32:J%=1
380 IF INKEY(-105) AND TF%=0 TF%=1:PY%=TY%-32:PX
%=972:MOVE PX%,PY%:PRINTP$:SOUND 0,-15,4,2
390 IF J%=0 ENDPROC
400 MOVE 1100,SY%:PRINTT$
410 MOVE 1100,TY%:PRINTT$
420 ENDPROC
430 DEF PROCBFIRE:MOVE GX%,GY%:GCOL0,2:VDU255:GX
%=GX%+64:MOVE GX%,GY%:PRINTG$:IF POINT(GX%,GY%)<>2
BF%=0:MOVE GX%-32,GY%:GCOL0,2:VDU255,255:SOUND 0,
-12,5,2
440 IF GX%=1060 AND TY%-GY%<96 AND TY%-GY%>-1 PR
OCHIT(1)
450 ENDPROC
460 DEF PROCTFIRE:MOVE PX%,PY%:GCOL0,2:VDU255:PX
%=PX%-64:MOVE PX%,PY%:PRINTP$:IF POINT(PX%,PY%)<>2
TF%=0:MOVE PX%-32,PY%:GCOL0,2:VDU255,255:SOUND 0,
-12,5,2
470 IF PX%=140 AND BY%-PY%<96 AND BY%-PY%>-1 PRO
CHIT(2)
480 ENDPROC
490 DEF PROCINIT
500 PRINT"CHR$141;CHR$134;TAB(10);"B O O T   H I
L L"
510 PRINTCHR$141;CHR$134;TAB(10);"B O O T   H I
L L"

```

```

520 PRINT CHR$132;TAB(11);"by Stephen Gray"
530 PRINT"" Take the role of Buffalo Bill or B
ig Bad Tom in this Western shootout for twoplayer
s. Shoot your opponent five times to win the game
and be declared the bestgunslinger in the West."
540 PRINT"CHR$130;"CONTROLS BILL TOM"
"CHR$131;"UP CAPS LOCK RETURN""CHR$13
1;"DOWN SHIFT LOCK DELETE""CHR$131;"FIRE
Z /"
550 PRINT"CHR$133;"Press RETURN to start"
560 #FX15
570 A=GET:IF A<>13 GOTO 570
580 ENVELOPE 1,1,0,0,0,1,1,1,120,-2,-2,-2,120,60
590 VDU 23,224,0,60,60,255,52,62,60,60,23,225,56
,124,126,127,127,127,126,126,23,226,126,126,102,10
2,102,102,119,119,23,228,0,0,63,248,240,0,0,0,23,2
30,120,124,120,0,0,0,0,0
600 VDU 23,234,0,60,60,255,44,124,60,60,23,235,2
8,62,126,254,254,254,126,126,23,236,126,126,102,10
2,102,102,238,238,23,238,0,0,252,31,15,0,0,0,23,24
0,0,0,30,62,30,0,0,0,23,255,255,255,255,255,255,25
5,255,255
610 VDU 23,241,15,15,15,7,7,7,7,31,23,242,0,0,0,
0,0,7,255,255,23,243,255,255,227,3,3,3,1,1,23,244,
248,192,192,192,192,192,224,224,23,245,7,31,63,127
,127,255,255,255,23,246,224,248,252,254,254,255,25
5,255
620 B$=CHR$18+CHR$3+CHR$3+CHR$224+CHR$8+CHR$10+C
HR$225+CHR$8+CHR$10+CHR$226+CHR$11+CHR$228;G$=CHR$
18+CHR$3+CHR$3+CHR$230
630 T$=CHR$18+CHR$3+CHR$2+CHR$234+CHR$8+CHR$10+C
HR$235+CHR$8+CHR$10+CHR$236+CHR$8+CHR$8+CHR$11+CHR
$238;P$=CHR$18+CHR$3+CHR$2+CHR$240
640 C$=CHR$18+CHR$0+CHR$0+CHR$241+CHR$242+CHR$8+
CHR$8+CHR$10+CHR$243+CHR$244+CHR$8+CHR$8+CHR$10+CH
R$18+CHR$0+CHR$3+CHR$245+CHR$246
650 F$=CHR$18+CHR$0+CHR$2+CHR$255+CHR$255+CHR$8+
CHR$8+CHR$8+CHR$10+CHR$255+CHR$255+CHR$255+CHR$255
+CHR$8+CHR$8+CHR$8+CHR$10+CHR$255+CHR$255

```

```

660 ENDPROC
670 DEF PROCSCREEN:VDU18,0,130,12,19,3,2;0;4,17,
3:PRINTTAB(0,0);" BILL TOM"
680 PRINTTAB(0,1);,B%,T%
690 GCOL0,3:MOVE 440,300:MOVE 840,300:PLOT 85,44
0,600:PLOT 85,840,600:PLOT 85,640,750:GCOL0,2:MOVE
600,300:MOVE 680,300:PLOT 85,600,400:PLOT 85,680,
400:MOVE 500,500:MOVE 600,500:PLOT 85,500,580:PLOT
85,600,580
700 MOVE 680,500:MOVE 780,500:PLOT 85,680,580:PL
OT 85,780,580:BY%=512:TY%=512:BF%=0:TF%=0:H=0
710 VDU5:MOVE 100,512:PRINTB$:MOVE 1100,512:PRIN
TT$:IF B%=0 AND T%=0 RESTORE 720:FOR G=1 TO 12:REA
D F,J:SOUND 1,1,F,J:NEXT
720 DATA 33,2,21,2,5,4,5,4,5,2,13,2,21,2,25,2,33
,4,33,4,33,4,21,4
730 FOR A=1 TO 2000:NEXT
740 ENDPROC
750 DEF PROCIT(H%)
760 IF H%=2 THEN MOVE 100,BY%:PRINTF$:MOVE 100,B
Y%:PRINTC$:T%=T%+1 ELSE MOVE 1100,TY%:PRINTF$:MOVE
1100,TY%:PRINTC$:B%=B%+1
770 RESTORE 780:FOR G=1 TO 11:READ F,H:SOUND 1,1
,F,H:NEXT
780 DATA 13,6,13,4,9,2,13,6,25,4,21,2,21,4,13,2,
13,4,9,2,13,6
790 FOR A=1 TO 4000:NEXT:H=1:TF%=0:BF%=0:ENDPROC
800 MODE7:PRINT':FOR A=1 TO 2:VDU141,131,136:PRI
NTTAB(10)"WELL DONE ":NEXT
810 PRINT':FOR A=1 TO 2:VDU141,129,136
820 IF B%=5 PRINTTAB(11)"BILL !!" ELSE PRINTTAB(
11)"TOM !!"
830 NEXT
840 PRINT':FOR A=1 TO 2:VDU134,141,136:PRINTTAB
(11)"YOU WIN":NEXT:PRINT""CHR$133;" Press RE
TURN to restart"
850 #FX15
860 A=GET:IF A<>13 GOTO 860
870 GOTO 110

```

Programs are always supplied on cassette and are accompanied by full details of the program variables, how the program works and any hints on conversion you can offer. Please type these details double spaced. Listings are helpful but not essential. What is vital is that the programs should be completely error free, so please double check.

Always use a coupon firmly fixed to the back of your envelope, and fully complete and enclose the cassette inlay card.

We are particularly interested in programs with less than 100 actual lines of BASIC. All submissions are acknowledged.

## Send your programs to HCW!

Use this cassette inlay card for your program

Name \_\_\_\_\_

Address \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Expansion needed \_\_\_\_\_

\_\_\_\_\_

Special loading instructions \_\_\_\_\_

\_\_\_\_\_

Program title \_\_\_\_\_  
Machine \_\_\_\_\_  
  
Program submission \_\_\_\_\_

Complete this coupon and stick it firmly on the back of your envelope

Name \_\_\_\_\_

Address \_\_\_\_\_

\_\_\_\_\_

Program title \_\_\_\_\_ Machine \_\_\_\_\_



# EDUCATION

**Choosing educational software for use in the home is John Henderson's subject this week. Read on and you will know what to look for in future**

Sometimes the only clue available to help parents in choosing software for their children to learn at home is the label *educational*. There is so much to choose from whatever the make of computer, yet often educational software bears little resemblance to what children are doing in schools. What should parents look for?

Well, start by thinking of the micro itself. How is it changing our lives by our involvement with it? It is creating changes in the way our children learn and this is the first clue to choosing software.

**Look at the software before buying.** If it seems to be the kind of drill and practice type exercise that was abundant in

our school days, the chances are that children will become quickly bored in the same way that we did. Hardly the best way to use new technology, which naturally motivates children. If you find the learning boring, children will too — using the micro should add a new dimension to learning enabling children to think more for themselves.

Allow younger children, especially, time to explore situations and extend themselves. Many shops now have facilities for previewing software, if not ask if it can be returned or exchanged after viewing at home (no copying of course).

When choosing a micro, fac-

tors such as range of colours available, sound options, peripheral ports etc. probably figure high on the list. Look then to see if software uses sound and colour effectively or merely to jazz up a poor program. Most educational programs use few space-invader type graphics or sound, but there are notable exceptions such as NUMBER CHASER from ASK. Colour can be particularly helpful to draw the attention of children to certain words on the screen, as can letters printed in double-height text. Above all the **screen display should be clear** to help children understand what is going on.

Program loading times can be important, especially with cassette users. Better publishers indicate clearly in their loading directions the length of time required to load. They also supply a duplicate copy of the program on the other side of the cassette in case of loading difficulties. This leads us to another clue to success — **the publishers name**.

Most reputable publishers want to protect the quality of their products and reject work that is below their own stan-

dards. Look for publishers who explain aims behind their programs and any add-ons that are required. Support materials and documentation illustrate the thought that has gone into developing a program. Spelling mistakes in documentation or the actual program often occur in poor programs. The inclusion of actual screen illustrations within their booklets is a good sign to look for. When you find a program that is successful at home, look for others from the same stable as a quick guide to quality.

Having loaded the software the next best thing to do is **annoy the program**. By this I mean make deliberate errors to see how the program handles mistakes. If you are asked to input a number, try to input a letter. Press W instead of A, answer NO instead of YES, or press ESCAPE to see what happens and how the program reacts.

A good program will always have some form of help page that the user can refer to and will, in some cases, actually direct the learning pattern. Children finding difficulties expect more help than a loud noise and a screen message showing a tick or a cross. Programs bearing a scoring system are often poor, emphasising competition in favour of education when the two can happily assist each other. Good drill and practice programs should have variable skill levels with lowest numbers for lowest skills, a record page to give some form of feedback, and a help section which shows clearly what is happening if children are making mistakes.

Learning to cope with mistakes takes a long time. The micro provides an ideal opportunity to make learning fun. The infinite patience of the machine coupled with speed and range of responses give our children opportunities that have never before been available. Disastrous software can throw away all the advantages and reduce the micro to an impersonal teaching machine.

Choosing software is often related to personal choice, but try to make these choices informed ones by seeing how others react. Educational programs for groups of children need groups of children to prove their value. Inviting friends around to play can

benefit your children (even if the noise level rises). The real key to choosing successful educational software is a dual involvement between parents and children.

Let's look at one suite of programs for infant children that are effective and enjoyable (even adults enjoy these). Adventure Playground is a suite of two programs based on nursery rhymes.

In Queen of Hearts, the screen display is split into two clear parts — the top half presents the graphics and the bottom half the text, which is a mixture of upper and lower case letters. Children are given clear information on which to act. They are told which exits are available to them using standard formats of N, S, E or W. YOU CAN SEE and YOU HAVE help to instil a picture in the minds of the children showing exactly which options are open to them.

Travellers in this magical world are allowed to carry only two objects at a time. This may seem small compared to other adventure programs, but is ample for younger children to cope with.

Using SWAP, TAKE and LEAVE allows plenty of flexibility with only a few words to learn to read. In fact, the whole aim of the program is to give confidence to young children. Many of us have dreamt of entering Aladdin's Cave, or taking the Yellow Brick Road to the enchanted wood. In Queen of Hearts it all comes alive in a meaningful way. As children collect and use the spider to frighten Miss Muffet, the proceed along an imaginative path full of intrigue.

Children particularly enjoy the friendly messages contained in the program. If travellers need to re-trace their steps, messages such as THE LAST TIME YOU CAME HERE YOU DRANK SOME MILK appear as reminders before the journey continues, all of which helps users to become familiar with the planned route.

After battling with wands, books, clocks and broomsticks to name but a few, the object of this adventure is to take the tarts to the Queen who lives in the castle. If you arrive without the tarts, the Queen is quite naturally upset. However, your problems may still not be over if you have the tarts, as the knave

is likely to steal them. What is worse, the wicked magician has jumbled up the route of your journey and the exploration must begin again.

What makes this so special and one of the best pieces of infant software on the market?

1. The stories have a natural appeal to the children as they are based on well-known rhymes.
2. The number of commands to be learnt is small — seven in all. This also means less typing.
3. The superb graphics are colourful and relevant to the adventure.
4. Care has been taken to disable the escape key.
5. In the documentation there is a clear directive for parents and children to use the programs together for the first time. This enables a realistic discussion of the possibilities. Having done this, the situations within the story are changed by the computer and the child embarks on a journey which, although meeting some familiar characters, is full of new adventures.

Crooked Adventure is a set of four games based on the poem THERE WAS A CROOKED MAN and the aim is to get the crooked man and his crooked cat and the crooked mouse to the crooked house. Sounds easy, but there are a few surprises on the way.

At the beginning music plays and the nursery rhyme is displayed on the screen. The beauty of this program is that it can be driven with any one key from the keyboard. In reality, the ARROW KEYS and BREAK pose problems. However this is particularly helpful for children with limited reading/manipulative skills. Even ESCAPE allows them to carry on.

Game one involves the crooked man in search of the crooked stile. Movement is by choosing one of four ways, and extra moves are gained by choosing the correct shape to complete the puzzle. On the way it is advantageous to collect as many of the three pairs of glasses hidden on the screen as possible, so that you can see your way to completing the trail.

Game two, the crooked sixpence, involves searching for hidden keys by matching the colours of pairs of trees. Game three is a simple chase game — the crooked cat has to catch the crooked mouse. Finally in game

four, all three have to get to the crooked house being careful not to fall down the traps.

Only when all three are in the house can children try the keys they have collected (up to five) to see if they can open the door. Thus the excitement is maintained to the very end, and very little reading skill is required. The real learning medium here is the discussion that goes on whilst the program is running.

**Value for money** does not necessarily mean the cheapest programs available. There is a plentiful supply of expensive rubbish on the educational scene. Reviews can be helpful, but the most effective strategy is to spend a long time looking at the software in the shop with the children who are going to use it, or to ask local teachers what is being used in schools.

Most teachers would be only too glad to supply help where necessary. Start by working through the programs with children so at least you are aware of some of the situations users are likely to meet and can talk about the results at the end of a computer session. The most effective judges are the children themselves — software that they keep going back to is a clear indication of success for them as individuals. For a final quick checklist, here are some golden rules:

1. **Look** before you buy.
2. Is the screen display clear?
3. Are colours and/or sound used effectively?
4. Is there a **Help** page always accessible?
5. Do you recognise the name of the publisher?
6. Use the program with your children and learn and talk with them.

#### Useful references:

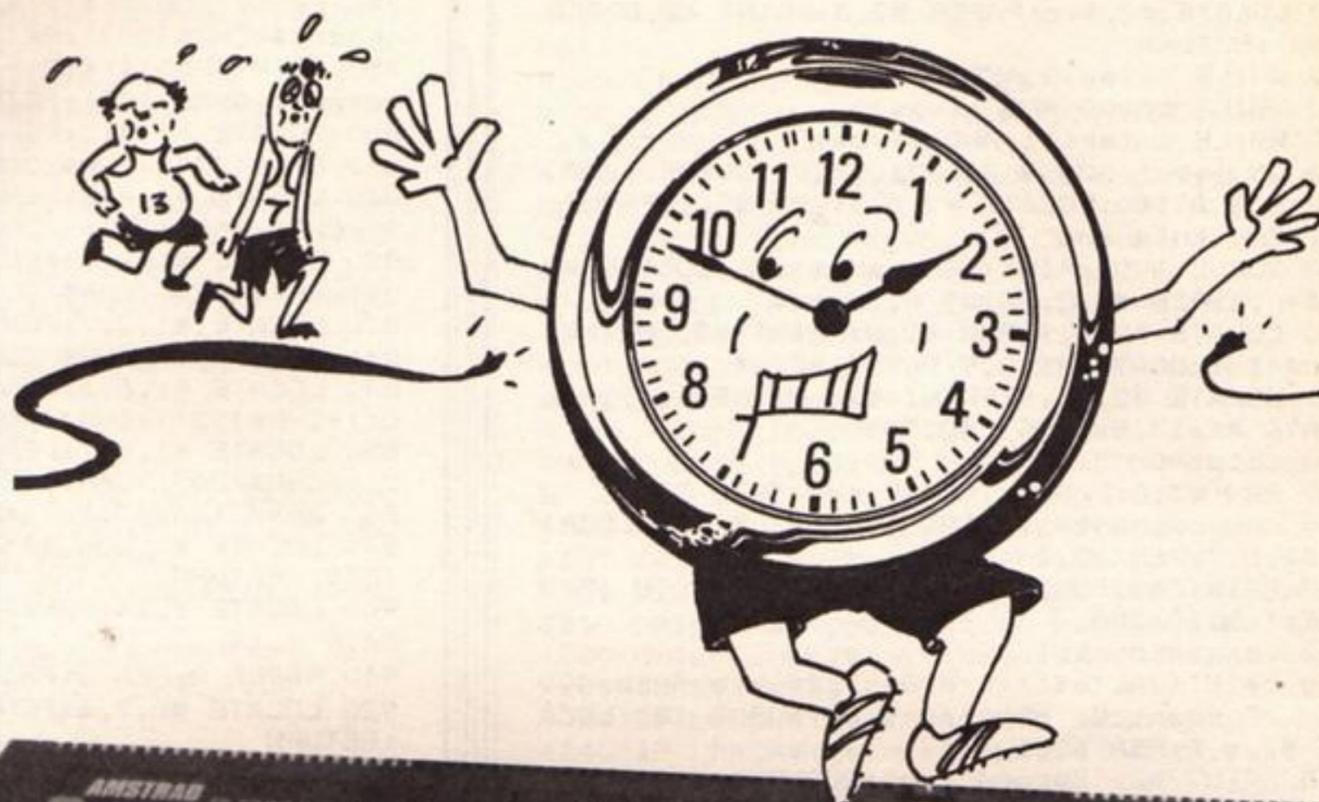
A Parent's Guide to Educational Software.  
Dr. Bill Tagg — Daily Telegraph — 1985.  
160 pages of useful advice for £5.95.

Pace — An Introduction to Educational Home Computing.  
Peter Kelly — Pace — 1984  
Informative and jargon free for £1.00.

Widgit Software  
Crooked Adventure  
Queen of Hearts  
1984  
£6.95

AMSTRAD CPC464

# BEAT THE CLOCK



**There's fun and education in John Wright's Sum-Vaders game for Amstrad CPC464 users**

Aimed at the seven to ten age range Sum-Vaders is designed to make a game out of practising your sums against the clock. So get those brains into action but don't forget to keep an eye on the time!

### How it works

10-50 initialisation calls  
 100 timer routine  
 110-160 controlled user input  
 165-175 sound sub-routine  
 180-190 unplotting sub-routine  
 200-620 main loop  
 700-750 compute sum  
 800-870 new invaders screen  
 900-910 update players ranking  
 920 update score  
 930 update laser power  
 940 update lives  
 1000-1100 set up playing screen  
 2000-2040 initialisation  
 2500-2660 get players name  
 3000-3090 title screen  
 4000-4400 end of game routines

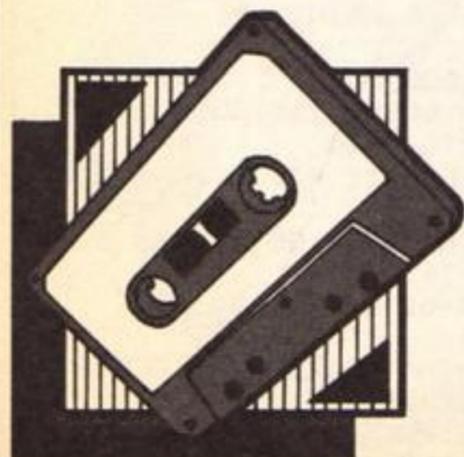
### Variables

score, lives, level, name\$ what else?  
 f, g, h flags  
 type max length of user input  
 a\$, b\$, x, y input  
 gun gun position

inv number of invaders  
 fire length of laser shot  
 laser laser position  
 count number of tries at sum  
 b, c, d, e sum values/answer  
 rank\$ name of highest scorer  
 best\$ name of highest scorer  
 high high score

```

15 REM *** SUM-VADERS Copyright John Wright 1985 ***
10 GOSUB 2000
15 GOSUB 2500
20 GOSUB 1000:GOSUB 800:score=0:lives=5:level=1
30 GOSUB 900:GOSUB 920:GOSUB 930:GOSUB 940
50 GOTO 200
100 AFTER 800 GOSUB 160:type=3:g=0
105 CLS #3:f=0:x=0:b$="":LOCATE #3,2,1:PRINT #3,"?":WHILE INKEY$<>"":WEND
110 f=0:x=0:WHILE f=0
115 a$="":WHILE a$="" AND f=0:a$=INKEY$:WEND
120 IF f=1 THEN 155
125 x=ASC(a$):y=LEN(b$)
130 IF x=13 THEN f=1:GOTO 155
135 IF x=127 AND y>0 THEN b$=LEFT$(b$,y-1):GOTO 150
140 IF y=type THEN f=1:GOTO 155
145 IF x<>127 THEN b$=b$+a$
150 CLS #3:LOCATE #3,2,1:PRINT #3,b$
155 WEND:RETURN
160 f=1:g=1:RETURN
165 SOUND 3,800,20,6:SOUND 3,1800,65,6:FOR j%=1 TO 2000:NEXT j%:RETURN
170 FOR j%=4 TO 200 STEP 2:SOUND 1,j%,1,5:NEXT:RETURN
175 SOUND 2,50,20,3:SOUND 2,70,30,3:RETURN
    
```



```

180 LOCATE #2,1,3:PAPER #2,3:PRINT #2,SPACE
$(20):RETURN
190 LOCATE #2,1,6:PAPER #2,3:PRINT #2,SPACE
$(20):RETURN
200 WHILE lives>0 AND level<7
210 WHILE inv>0 AND lives>0
220 WHILE laser<11 AND lives>0
240 ON level GOSUB 700,710,720,730,740,750
250 GOSUB 180:LOCATE #2,5,3:PEN #2,1:PRINT
#2,"Try this one"
260 GOSUB 190:x=INT(LEN(name$)/2):LOCATE #2
,11-x,6:PEN #2,2:PRINT #2,name$
270 LOCATE #2,4,9:PEN #2,0:PRINT #2, USING
"###";c:LOCATE #2,8,9:PRINT #2,x$
280 LOCATE #2,10,9:PRINT #2, USING "##";d:L
OCATE #2,13,9:PRINT #2,"="
290 count=0
300 PEN #3,0:GOSUB 100:IF g=0 THEN 330
310 count=count+1:GOSUB 170:GOSUB 180:LOCAT
E #2,5,3:PEN #2,1
320 PRINT #2,"Out of Time":FOR j%=1 TO 1500
:NEXT:GOTO 350
330 count=count+1
340 b=INT(VAL(b$)):b=ABS(b):IF b=e THEN 400
350 IF count=2 THEN 360 ELSE GOSUB 180:LOCA
TE #2,6,3:PEN #2,1
355 PRINT #2,"Second Try":GOSUB 165:GOTO 30
0
360 GOSUB 180:GOSUB 190:LOCATE #2,6,3:PEN #
2,0:PRINT #2,"Hard Luck"
370 LOCATE #2,2,6:PRINT #2,"CORRECT ANSWER
IS"
380 CLS #3:LOCATE #3,2,1:PRINT #3,e:FOR j%=
1 TO 2500:NEXT:lives=lives-1
390 GOSUB 940:FOR j%=1 TO 2000:NEXT:GOTO 41
0
400 GOSUB 175:IF count=1 THEN score=score+1
0 ELSE score=score+5
405 GOSUB 920:GOSUB 930:FOR j%=1 TO 2000:NE
XT
410 CLS #2:CLS #3:WEND
420 IF lives=0 THEN 570
430 BORDER 6,24:FOR j%=1 TO 6:SOUND 1,90,10
,5:SOUND 1,110,10,5:NEXT
440 LOCATE #2,3,6:PEN #2,1:PRINT #2,"PRESS
SPACE BAR"
450 IF inv>1 THEN fire=8 ELSE fire=4
460 WHILE INKEY(47)=-1:WEND:SOUND 3,150,10,
7,0,0,10
470 FOR j%=13 TO fire STEP -1:LOCATE #1,gun
,j%:PEN #1,2:PRINT #1,CHR$(145)
480 FOR i=1 TO 75:NEXT:LOCATE #1,gun,j%:PAP
ER #1,0:PRINT #1," ":NEXT:BORDER 1
490 FOR j%=2000 TO 200 STEP -25:SOUND 5,RND
*j%,2,j%/200,0,0,j%/100:NEXT
500 LOCATE #1,gun-1,fire-2:PAPER #1,0:PRINT
#1," ":LOCATE #1,gun-1,fire-1
510 PRINT #1," ":LOCATE #1,gun,14:PAPER #
1,0:PRINT #1," "
520 inv=inv-1:IF inv=0 THEN 550
530 IF inv=1 THEN gun=5
540 IF inv=2 THEN gun=7
550 GOSUB 870:score=score+10:GOSUB 920:lase
r=1:LOCATE #0,1,3:PAPER #0,4
560 PRINT #0,SPACE$(11):GOSUB 930
570 CLS #2:WEND
580 IF lives=0 THEN 610
590 level=level+1:IF level=7 THEN 610
600 GOSUB 900:CLS #1:GOSUB 800
610 WEND
620 GOTO 4000
700 c=INT(RND(1)*15)+1:d=INT(RND(1)*15)+1:e
=c+d:x$=CHR$(159):RETURN
710 c=INT(RND(1)*15)+10:d=INT(RND(1)*c)+1:e
=c-d:x$=CHR$(154):RETURN
720 c=INT(RND(1)*120)+1:d=INT(RND(1)*50)+1:
e=c+d:x$=CHR$(159):RETURN

```

```

730 c=INT(RND(1)*60)+40:d=INT(RND(1)*c)+1:e
=c-d:x$=CHR$(154):RETURN
740 c=INT(RND(1)*12)+1:d=INT(RND(1)*12)+1:e
=c*d:x$=CHR$(203):RETURN
750 d=INT(RND(1)*12)+1:e=INT(RND(1)*12)+1:c
=d*e:x$=CHR$(172):RETURN
800 LOCATE #1,4,2:PEN #1,11:PRINT #1,CHR$(2
04)+CHR$(224)+CHR$(205)
810 LOCATE #1,4,3:PEN #1,9:PRINT #1,CHR$(22
1)+CHR$(207)+CHR$(220)
820 LOCATE #1,2,6:PEN #1,12:PRINT #1,CHR$(2
04)+CHR$(224)+CHR$(205)
830 LOCATE #1,2,7:PEN #1,10:PRINT #1,CHR$(2
21)+CHR$(207)+CHR$(220)
840 LOCATE #1,6,6:PEN #1,12:PRINT #1,CHR$(2
04)+CHR$(224)+CHR$(205)
850 LOCATE #1,6,7:PEN #1,10:PRINT #1,CHR$(2
21)+CHR$(207)+CHR$(220)
860 gun=3:inv=3:laser=1
870 LOCATE #1,gun,14:PEN #1,2:PRINT #1,CHR$
(239):RETURN
900 LOCATE 1,14:PAPER 4:PRINT SPACE$(10):LO
CATE 1,14
910 PAPER 0:PEN 2:PRINT rank$(level):RETURN
920 LOCATE #0,7,6:PEN 0:PAPER 4:PRINT score
:RETURN
930 LOCATE #0,laser,3:PEN 2:PAPER 4:PRINT p
ower$:laser=laser+2:RETURN
940 LOCATE #0,7,9:PEN 0:PAPER 4:PRINT lives
:RETURN
1000 MODE 0:BORDER 1:CLS:RANDOMIZE TIME
1010 INK 0,0:INK 1,2:INK 2,6:INK 3,13:INK 4
,25
1020 INK 9,6,24:INK 10,24,6:INK 11,18,2:INK
12,2,18
1030 WINDOW #0,1,11,1,14:WINDOW #1,12,20,1,
14:WINDOW #3,14,20,23,23
1040 PAPER #0,4:CLS #0:PAPER #1,0:CLS #1
1050 WINDOW #2,1,20,15,25:PAPER #2,3:CLS #2
1060 PAPER #3,3:CLS #3
1070 LOCATE #0,1,1:PEN 2:PAPER 0:PRINT #0,"
LASER POWER"
1080 PEN 0:PAPER 4:LOCATE #0,1,6:PRINT #0,"
SCORE="
1090 LOCATE #0,1,9:PRINT #0,"LIVES=":LOCATE
#0,1,12:PRINT #0,"RANKING"
1100 LOCATE #0,1,12:PRINT #0,"RANKING":RETU
RN
2000 DIM rank$(6):SPEED INK 50,20:RESTORE 2
030
2010 FOR j=1 TO 6:READ a$:rank$(j)=a$:NEXT
2030 DATA Cadet,Corporal,Sergeant,Captain,M
ajor,General
2040 power$=CHR$(154)+CHR$(154)+CHR$(243):b
est$="":high=0:RETURN
2500 MODE 1:CALL &BC02:CALL &BB4E
2510 BORDER 0:INK 0,0:INK 1,0:INK 2,2:INK 3
,24:GOSUB 3000
2520 FOR i%=2 TO 24 STEP 2:SOUND 3,i%*10,20
,5:SOUND 3,i%*20,10,5
2530 INK 2,26-i%:INK 3,i%:FOR j%=1 TO 500:N
EXT j%:NEXT i%
2540 SOUND 3,600,60,5:WINDOW #3,12,29,20,20
:PAPER #3,0:CLS #3
2550 LOCATE #0,9,15:PEN 3:PRINT "Please typ
e in your name"
2560 type=15:PEN #3,2:GOSUB 105
2565 IF LEN(b$)=0 THEN GOSUB 165:GOTO 2560
2570 IF y<type THEN GOTO 2600
2580 CLS #3:GOSUB 165:LOCATE #3,3,1:PRINT #
3,"Shorter please"
2590 FOR j%=1 TO 2000:NEXT j%:GOTO 2560
2600 x=0:x=INSTR(b$," ")
2610 IF x=0 THEN name$=b$:GOTO 2630
2620 name$=LEFT$(b$,x)
2630 LOCATE #0,8,15:PRINT SPACE$(26):CLS #3
:b$="OK , "+name$:x=INT(LEN(b$)/2)
2640 LOCATE #0,21-x,18:PEN 3:PRINT b$:SPEED

```

```

INK 30,30
2650 INK 1,0,6:LOCATE #0,10,22:PEN 1:PRINT
"Press SPACE BAR to play"
2660 WHILE INKEY(47)=-1:WEND:RETURN
3000 PEN 1:LOCATE 1,25:PRINT "SUM-VADERS"
3010 FOR i%=0 TO 160 STEP 2
3020 FOR j%=0 TO 16 STEP 2
3030 IF TEST(i%,j%) THEN PLOT 165+i%*2,355+
j%*2,3:PLOT 165+i%*2,357+j%*2:PLOT 167+i%*2
,355+j%*2:PLOT 167+i%*2,357+j%*2
3040 NEXT j%:NEXT i%:LOCATE 1,25:PRINT SPAC
E$(18)
3050 PEN 1:LOCATE 1,25:PRINT "BY JOHN WRIGH
T"
3060 FOR i%=0 TO 224 STEP 2
3070 FOR j%=0 TO 16 STEP 2
3080 IF TEST(i%,j%) THEN PLOT 100+i%*2,300+
j%*2,2:PLOT 100+i%*2,302+j%*2:PLOT 102+i%*2
,300+j%*2:PLOT 102+i%*2,302+j%*2
3090 NEXT j%:NEXT i%:LOCATE 1,25:PRINT SPAC
E$(24):PEN 2:RETURN
4000 MODE 1:CALL &BC02:CALL &BB4E:h=0
4010 INK 0,1:INK 1,6:INK 2,11:INK 3,26
4020 PAPER 0:CLS:BORDER 14
4030 IF score<high THEN 4100
4040 high = score:best$=name$:h=2:FOR j%=1
TO 3:GOSUB 175:NEXT
4050 LOCATE 12,8:PEN 1:PRINT "A NEW HIGH SC
ORE"
4060 LOCATE 18,12:PEN 3:PRINT high:LOCATE 1
6,16:PRINT "scored by"
4070 LOCATE 20-INT(LEN(best$)/2),20:PEN 2:P
RINT best$:FOR j%=1 TO 8000:NEXT

```

```

4100 CLS:IF level <7 THEN 4200
4110 FOR j%=200 TO 4 STEP-1:SOUND 2,j%,1,5:
NEXT
4120 x$="Well done "+name$
4130 LOCATE 21-INT(LEN(x$)/2),5:PEN 2:PRINT
x$:LOCATE 7,10
4140 PRINT "You have reached the rank of":L
OCATE 15,15:PEN 1
4150 PRINT "Air Marshall":LOCATE 14,22:PEN
3:PRINT "Press any Key"
4160 WHILE INKEY$<>"":WEND:IF f=2 THEN 4300
4200 CLS:IF h=2 THEN 4300
4210 GOSUB 170:LOCATE 20-INT(LEN(name$)/2),
5:PEN 2:PRINT name$
4220 LOCATE 15,10:PRINT "Scored ";score
4230 LOCATE 7,15:PEN 1:PRINT "The best so f
ar is ";high;" by"
4240 LOCATE 20-INT(LEN(best$)/2),20:PEN 1:P
RINT best$:FOR j%=1 TO 8000:NEXT
4300 CLS:SOUND 3,500,50,5:LOCATE 5,4:PEN 2
4310 PRINT "Do you want to play again..Y/N"
4320 WHILE INKEY$<>"":WEND:a$="":WHILE a$=""
:a$=INKEY$:WEND
4330 IF UPPER$(a$)="N" THEN CALL &O
4340 IF UPPER$(a$)="Y" THEN 4360
4350 GOTO 4320
4360 LOCATE 4,4:PEN 1:PRINT "          Same p
layer..Y/N          ":REM 8+8 spaces
4370 WHILE INKEY$<>"":WEND:a$="":WHILE a$=""
:a$=INKEY$:WEND
4380 IF UPPER$(a$)="N" THEN 15
4390 IF UPPER$(a$)="Y" THEN 20
4400 GOTO 4370

```

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# BRIGTHT SPRITES

*In this first part of a new series for C64 owners, Andrew Clarke explains what sprites are, how to put them on screen and which memory locations control them*

Sprite graphics on the Commodore 64 are difficult to understand and use but are child's play when you have the necessary knowledge to get them on screen and moving about.

They have several advantages over UDGs in that they are fairly easily defined, quite simple to move and animate, and are far more 'mobile' in that you do not have to go through the continuous routine of moving and rubbing out the old position. They can be imagined as a sheet of plastic placed on the screen which may be defined as you wish and moved at will — rather similar to the technique used by cartoon makers.

Firstly let's get through all the barriers and get a sprite on the screen. Type 'V=53248' and Press RETURN then type 'POKEV+21,1' and press RETURN once again. You have now given the variable V the value of the location of the first register of the 64's graphics chip — the VIC chip. The second instruction simply tells the computer to switch on sprite number 0 — remember they are numbered 0 to 7!

Although you have switched on the sprite nothing should appear on screen yet, simply because you have not positioned it. Type 'POKEV,150' and press RETURN then type 'POKEV+1,150' and press RETURN.

You should now have something on screen. It will not look too exciting because you are looking at an undefined sprite — that is, you have not yet altered it to your needs. If you have nothing on screen try typing these additional instructions — 'POKEV+39,1' and 'POKE2040,199'. Then you ought to have something to see.

The latter two instructions turn the sprite colour to white

and tell the sprite to get its data from block number 199. These are used in case your sprite registers are set differently — for example, the sprite may have been blue (the same colour as the screen) and therefore invisible, or the sprite pointer may have been pointing at a sprite block where no data of any description was present!

For the moment let us discuss 'POKEV,150' and 'POKEV+1,150'. The first deals with sprite zero's X position — if the screen was given an axis horizontally then it would be called the X axis. A vertical axis would be the Y axis and this is programmed by the second instruction.

If you have experience with graphs then imagine the screen as a piece of graph paper with the zeroes of both the axes in the top left corner. The figures after the comma relate to the position on the screen. For experimentation purposes type those instructions again but this time use different figures (from 0 to 255) and you will see the sprite appear in various locations. It is possible that it won't be on screen because the 'sprite screen' is bigger than actual screen which you can view!

This screen is shown in Figure 1. You'll see that the X position

### Sprite Pointer Locations

2040	Sprite 0's pointer
2041	Sprite 1's pointer
2042	Sprite 2's pointer
2043	Sprite 3's pointer
2044	Sprite 4's pointer
2045	Sprite 5's pointer
2046	Sprite 6's pointer
2047	Sprite 7's pointer

Table of sprite locations

V = 53248

Location(V)	Numerical	Purpose
V	53248	Sprite 0's X position
V+1	53249	Sprite 0's Y position
V+2	53250	Sprite 1's X position
V+3	53251	Sprite 1's Y position
V+4	53252	Sprite 2's X position
V+5	53253	Sprite 2's Y position
V+6	53254	Sprite 3's X position
V+7	53255	Sprite 3's Y position
V+8	53256	Sprite 4's X position
V+9	53257	Sprite 4's Y position
V+10	53258	Sprite 5's X position
V+11	53259	Sprite 5's Y position
V+12	53260	Sprite 6's X position
V+13	53261	Sprite 6's Y position
V+14	53262	Sprite 7's X position
V+15	53263	Sprite 7's Y position
V+16	53264	Far X position for all sprites
V+17 to V+20		not relevant
V+21	53269	Turn on sprites
V+23	53271	Expand sprite vertically
V+27	53275	Sprite to background priority
V+28	53276	Switch on multi-colour sprites
V+29	53277	Expand sprite horizontally
V+30	53278	Collision register (sprite to sprite)
V+31	53279	Collision register (sprite to backgrnd)
V+32	53280	Border colour of screen
V+33	53281	Background colour of screen
V+37	53285	Multi-colour 1
V+38	53286	Multi-colour 2
V+39	53287	Sprite 0's colour
V+40	53288	Sprite 1's colour
V+41	53289	Sprite 2's colour
V+42	53290	Sprite 3's colour
V+43	53291	Sprite 4's colour
V+44	53292	Sprite 5's colour
V+45	53293	Sprite 6's colour
V+46	53294	Sprite 7's colour

Figure 2

only extends part of the way across the screen. Do not worry! This is easily overcome. Just POKEV + 16 with any one of the following values:

- 1 — Sprite Zero
- 2 — Sprite One
- 4 — Sprite Two
- 8 — Sprite Three
- 16 — Sprite Four
- 32 — Sprite Five
- 64 — Sprite Six
- 128 — Sprite Seven

This will switch the appropriate sprite onto the far X position. To switch more than one sprite add up the values and POKE that in. For example for Sprites One, Three and Four the value is  $26 - 2 + 8 + 16 = 16$ . You will find that this method is used in most of the registers needed to control sprites — multi colour, expansion etc. — so it is worth remembering.

To switch back to the near X position simply omit the value from the total and rePOKE the far X register. You can POKE the X position register with 0 to 255 but only values of 0 to 80 will allow the sprite to be visible.

I suppose before we go much further it would be interesting to have something good to look at. Therefore the following short program will define a sprite. You can have some fun with the sprite pointer register at 2040. Poke it with any value from 0 to 255. You'll notice that lower values will flicker at times — block 2 is generally of this variety.

What you are looking at is the 64's operating system — the living part of the 64 if you like. Higher in memory is the character set and then your own program space. Generally it is best to store sprite data after block 199 — on larger programs use higher locations or switch blocks altogether. The Programmer's Reference Guide will be of great help at this stage.

After running this program you will have a Droid sprite on screen, coloured white. If it isn't white then type 'POKEV + 39,1'. This simply tells the VIC chip to colour sprite zero white. To change the colour POKE that location with one of the other figures below:

- 0 — Black
- 1 — White
- 2 — Red
- 3 — Cyan
- 4 — Purple
- 5 — Green

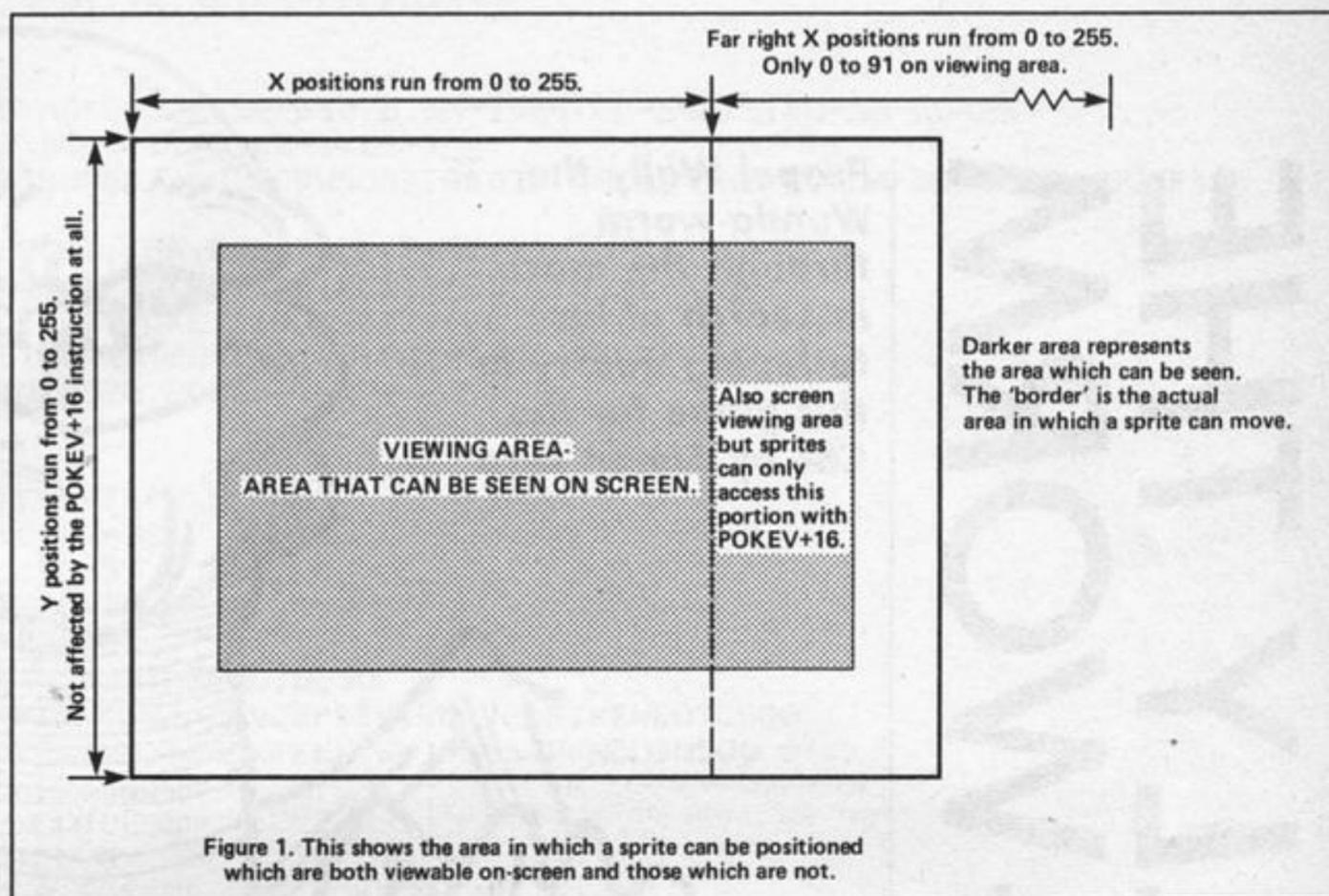


Figure 1. This shows the area in which a sprite can be positioned which are both viewable on-screen and those which are not.

- 6 — Blue
- 7 — Yellow
- 8 — Orange
- 9 — Brown
- 10 — Light Red
- 11 — Gray 1
- 12 — Gray 2
- 13 — Light Green
- 14 — Light Blue
- 15 — Gray 3

You will probably notice that some colours do not come out too well on the blue background. Changing the background colour generally helps but surprise surprise no colour will show up on a screen of an identical colour. If you try to POKE sprite zero blue it will vanish — but it is still there. If you run the cursor past the sprite position you'll see that it hasn't moved, it has just been

### Sprite Definition Program

```

0 REM ***** PROGRAM ONE *****
1 REM ***** SPRITE DEFINITION
2 REM ***** PROGRAM *****
10 FORT=0T062:READA
20 POKE199*64+T,A:NEXT
30 POKE2040,199
99 REM ** DATA FOR DROID CHARACTER **
100 DATA0,0,0,0,0,0,1
110 DATA255,0,3,255,128,228,16
120 DATA71,164,146,69,164,16,69
130 DATA135,255,193,131,255,129,190
140 DATA16,253,252,16,127,184,56
150 DATA61,160,0,5,150,0,5
160 DATA190,0,253,130,0,129,175
170 DATA199,245,232,68,23,233,68
180 DATA56,62,254,124,1,255,0
    
```

camouflaged with the background.

You'll probably wonder what happens if you POKEV + 39 with a higher value (16 to 255). Don't expect unlimited colours though the same sixteen are simply repeated. As with most of the locations given here anything over 255 will result in an "illegal quantity error".

As you have probably realised by now getting a sprite actually on screen is easy. You just need to remember your V + 21s and the V + 39s. It may seem a little difficult at first but if you resolve to have at least half an hour each night at the keyboard they'll become second nature.

Of course, location V + 21 is actually value 53269 and V + 1 should be 53249 but which do you think you can remember

most easily? I know which one I prefer and I think whoever wrote the CBM 64 Programmer's Reference Guide agrees with me. This is obviously one standard but I'd recommend using it as your own as it makes other people's programs far easier to understand.

Fig. 2 is a complete list of sprite commands using the variable V as the starter location. Included are the numerical equivalents purely for a reference basis. So far I have used sprite zero, but using the information in the chart you can try to get the other sprites on screen too.

As a piece of homework I'd like you in particular to get sprites 1, 2 and 5 on screen. Colour them all yellow and make them all access sprite block 199. Solution next time.

C64 GAME

# WALLY THE WUNDA-WORM

**Propel Wally the Wunda-worm through the maze in search of his fattening quarry in this game for the C64 by Simon Eyre**

Unlike most worms who favour a diet of soil, Wally has cultivated a taste for buns and if he can't consume ten he won't be able to progress to the next level of this four screen game where ten more buns await the voracious arthropod. Toadstools which litter his path are deadly and should be wriggled around.

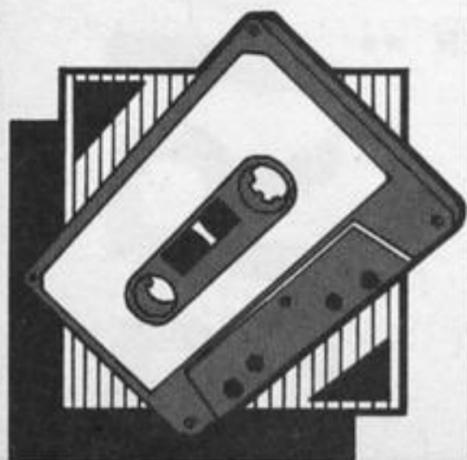
This worm will turn if you press Q to go up, A to go down, O to left and P to go right.

### Variables

WM position of worm  
 CL poke of colour  
 SR sustain, release  
 AD attack decay  
 WA waveform  
 VO volume  
 HI hi-frequency  
 LO low-frequency  
 LE no of level  
 LV no of level  
 KE key check

### How it works

10-50 initialise variables  
 60-125 set screen according to level  
 130-170 check for key press  
 180-220 check for collision  
 230-290 move Wally  
 500-580 deduct one life  
 800-840 add one bun to tally  
 850-940 move up a level  
 1000-1020 set up level one  
 1030-2010 set up level two  
 2020-2040 set up level three  
 2050-3010 set up level four  
 3020-3110 end game/restart  
 4000-5000 print toadstools and buns  
 5010-5100 set up UDG's  
 5200-5310 instructions  
 6000-6060 data for UDG's



```

10 POKES3280,2:POKES3281,15:PRINT"[CLEAR]"
20 GOSUB 5010
30 GOSUB 5200
40 VO=54296:WA=54276:AD=54277:SR=54278:WM=1964:CL=54272:PO=39:LV=25
50 HI=54273:LO=54272:SC=0:LI=3:LE=1:DI=1
60 PRINT"[CLEAR][c 7]BUNS:";SC;"[RVSON][RED] WALLY THE WUNDA WORM [RVSOFF][c 7]
  J LIFE:";LI
70 FORI=1064TO1103:POKEI,196:POKEI+CL,2:NEXT
80 FORI=1103TO2023STEP40:POKEI,160:POKEI+CL,2:NEXT
90 FORI=2023TO1984STEP-1:POKEI,160:POKEI+CL,2:NEXT
100 FORI=1984TO1063STEP-40:POKEI,160:POKEI+CL,2:NEXT
110 ONLEGOTO1000,1030,2020,2080
120 IFLE=5GOTO5000
125 GOTO4000
130 KE=PEEK(197):IFKE=64THEN180
140 IFKE=62THENDI--40:PO=36
150 IFKE=10THENDI=40:PO=37
160 IFKE=38THENDI--1:PO=38
170 IFKE=41THENDI=1:PO=39
180 WM=WM+DI:IFPEEK(WM)=32THENGOTO230
190 IFPEEK(WM)=160ORPEEK(WM)=209ORPEEK(WM)=215THENGOTO500
200 IFPEEK(WM)=41ORPEEK(WM)=35ORPEEK(WM)=196THENGOTO500
210 IFPEEK(WM)=40THENGOTO800
220 IFPEEK(WM)=41THENGOTO500
230 POKEWM,PO:POKEWM+CL,6
240 POKEVO,10:POKEAD,8:POKESR,255:POKEWA,33
250 POKEHI,43:FORI=1TO15:NEXTI:POKESR,0:POKEWA,0
260 POKEAD,0:POKEHI,0
270 K=RND(1)
280 IFK>.2THENPOKEWM,41:GOTO130
290 POKEWM,32:GOTO130
500 FORI=15TO0STEP-2:POKES3280,I:POKEVO,I:POKEAD,8:POKESR,255
510 POKEWA,129:POKEHI,38:FORT=1TO100:NEXTI:POKEWA,0:POKEAD,0:POKESR,0
520 POKEHI,0:NEXTI
530 PRINT"[HOME][DOWN][DOWN][DOWN][DOWN][DOWN][DOWN][DOWN][DOWN][DOWN][DOWN][DOWN]
  N][DOWN][RVSON][RED] WALLY WORM HAS LOST A LIFE "
535 FORR=1TO3
540 FORI=100TO120STEP2:POKEVO,15:POKEAD,20:POKESR,30
550 POKEWA,17:POKEHI,I:POKELO,200:FORT=1TO10:NEXTI:SC=0:POKES3280,2
560 POKEWA,0:POKEHI,0:POKEAD,0:POKESR,0:NEXTI:NEXTR:POKEVO,0
570 LI=LI-1:IFLI=0THENGOTO3020
580 WM=1964:DI=1:PO=39:GOTO60
800 POKEVO,15:POKEAD,16:POKESR,128:POKEWA,17
810 FORI=100TO130:POKEHI,I:POKEHI,0:NEXTI
820 POKEWA,0:POKEAD,0:POKESR,0:POKEVO,0
825 SC=SC+1:IFSC=10THENGOTO850
830 PRINT"[HOME][c 7]BUNS:";SC;"[RVSON][RED] WALLY THE WUNDA WORM [RVSOFF][c 7]
  J LIFE:";LI
840 POKEWM,32:GOTO130
850 FORT=1TO4
860 POKEVO,15:POKESR,255:POKEAD,64:POKEWA,33
870 POKEHI,57:FORI=1TO50:NEXTI
880 POKESR,0:POKEWA,0:POKEHI,0:POKEAD,0
890 POKESR,255:POKEAD,128:POKEWA,33:POKEHI,38
900 FORI=1TO80:NEXTI:POKEWA,0:POKEHI,0:POKEAD,0:POKESR,0
910 NEXTI
920 PRINT"[CLEAR][DOWN][DOWN][DOWN][DOWN][DOWN][DOWN][DOWN][DOWN][DOWN][DOWN][RV
  SON][RED]*****WALLY IS ON THE NEXT LEVEL*****"
930 FORI=1TO500:NEXTI:LE=LE+1:LV=LV+4:SC=0:WM=1964:PO=39:DI=1
940 GOTO60
998 END
999 REM *LEVEL ONE*
1000 PRINT"[HOME][DOWN][DOWN][DOWN][DOWN][DOWN][DOWN][DOWN][DOWN][BLUE]"
1010 FORI=1TO10:PRINT"[RIGHT][RIGHT][RIGHT][RIGHT][RIGHT][RIGHT][RIGHT][RIGHT][R
  IGH][RIGHT][RIGHT][RVSON][RED][s Q][s W][s Q][s Q][s W][s Q][s Q][s W][s Q][s Q]
  ][s W][s Q][s Q][s W][s Q][s Q][s W]":NEXT
1020 GOTO120
1029 REM *LEVEL TWO*

```

```

1030 FORI=1274TO1594STEP40:POKEI,160:POKEI+CL,4:POKEI+4,160:POKEI+CL+4,4
1040 NEXT:FORI=1361TO1561STEP40:POKEI,160:POKEI+6,160:POKEI+12,160
1050 POKEI+CL,4:POKEI+CL+6,4:POKEI+CL+12,4:NEXTI
1060 FORI=1321TO1324:POKEI,160:POKEI+(40*7),160:POKEI+CL,4
1070 POKEI+CL+(40*7),4:NEXTI
1080 FORI=1608TO1612:POKEI,160:POKEI+CL,4:NEXTI:FORI=1610TO1610-(40*3)STEP-40
1090 POKEI,160:POKEI+CL,4:NEXT
2000 FORI=1434TO1437:POKEI,160:POKEI+CL,4:NEXTI
2010 GOTO120
2020 FORI=1188TO1195:POKEI,160:POKEI+40,160:POKEI+80,160:POKEI+120,160
2030 POKEI+360,160:POKEI+400,160:POKEI+440,160:POKEI+480,160
2040 POKEI+CL,8:POKEI+CL+40,8:POKEI+CL+80,8:POKEI+CL+120,8
2050 POKEI+CL+360,8:POKEI+CL+400,8:POKEI+CL+440,8:POKEI+CL+480,8
2060 NEXT:PRINT"[DOWN]":FORI=1TO17:PRINT"[PURPLE][RIGHT][RIGHT][RIGHT][RIGHT][RI
GHT][RIGHT][RIGHT][RIGHT][RIGHT][RIGHT][RIGHT][RIGHT][RIGHT][RIGHT][RIGHT
][RIGHT][RIGHT][RIGHT][RIGHT][RVSON][s Q][s W][s Q][s W][s Q][s W]
[s Q][s W][s Q][s W]"
2070 NEXT:GOTO120
2080 PRINT"[HOME][DOWN][DOWN][DOWN][DOWN][BLACK]":FORI=1TO3:FORT=1TO3
2090 PRINT"[RIGHT][RIGHT][RIGHT][RVSON][s Q][s Q][s Q][s Q][RIGHT][RIGHT][RIGHT]
[s W][s W][s W][s W][RIGHT][RIGHT][RIGHT][s Q][s Q][s Q][s Q][RIGHT][RIGHT][RIGH
T][s W][s W][s W][s W][RIGHT][RIGHT][RIGHT][s Q][s Q][s Q][s Q]"
3000 NEXT:PRINT"[DOWN][DOWN]":NEXTI
3010 GOTO120
3020 PRINT"[CLEAR][DOWN][DOWN][DOWN][RVSON][RED]*****WALLY IS DEAD,SO SAD SNIF
F *****"
3030 PRINT"[DOWN][DOWN][RIGHT][RIGHT][RIGHT][RIGHT][RIGHT][RIGHT][BLUE]BUT DO NOT FEAR
HOORAY HOORAY "
3040 PRINT"[DOWN][RIGHT][RIGHT][RIGHT][RIGHT][RIGHT]THE WONDA OF WALLY HAS BROUG
HT"
3050 PRINT"[DOWN][RIGHT][RIGHT][RIGHT][RIGHT][RIGHT]HIM BACK TO LIFE ! WHOOPEE!
"
3060 PRINT"[DOWN][DOWN][RIGHT][RIGHT][RIGHT][RIGHT]LOOK ! LOOK YONDER I.E BELO
W "
3070 FORI=1TO500:NEXT:FORI=1704TO1743:POKEI,39:POKEI+CL,2
3080 FORT=1TO20:NEXT:POKEI,41:NEXTI
3090 PRINT"[DOWN][DOWN][DOWN][DOWN][RVSON] PRESS ANY KEY TO PLAY AGAIN
"
3100 POKE198,0:WAIT198,1:POKE198,0
3110 GOTO40
4000 FORK=1TO15
4010 T=INT(RND(1)*800)+1:T=T+1064
4020 IFPEEK(T)<>32THENGOTO4010
4030 POKET,40:POKET+CL,10:NEXTK
4040 FORK=1TOLU
4050 T=INT(RND(1)*800)+1:T=T+1064
4060 IFPEEK(T)<>32THENGOTO4050
4070 POKET,35:POKET+CL,0:NEXTK
4080 GOTO130
5000 LV=LV+20:LE=1:GOTO130
5010 PRINT"[CLEAR][BLACK]PLEASE WAIT FOR WALLYS UDG TO BE MADE"
5014 PRINT"[DOWN][DOWN][RED]WRITTEN BY SIMON EYRE 1985 5 JANUARY"
5020 POKE56334,PEEK(56334)AND254:POKE1,PEEK(1)AND251
5030 FORL=0TO1720:POKEL+12288,PEEK(L+53248):NEXT
5090 POKE1,PEEK(1)OR4:POKE56334,PEEK(56334)OR1
5100 FORC=0TO6:FORB=0TO7:READN:POKE12568+(8*C)+B,N:NEXTB,C
5110 POKE53272,29:RETURN
5200 PRINT"[CLEAR][RIGHT][RIGHT][RIGHT][RIGHT][RIGHT][RIGHT][RIGHT][RIGHT][RVSON]
[BLUE]WALLY THE WONDA WORM "
5210 PRINT"[DOWN][DOWN][RIGHT][RED]GUIDE WALLY AROUND THE SCREEN EATING"
5220 PRINT"[DOWN][RIGHT]THE BUNS BUT AVOIDING ALL OTHER OBJECTS"
5230 PRINT"[RIGHT]COLLECT 10 BUNS TO ENTER NEXT LEVEL"
5240 PRINT"[DOWN][DOWN][DOWN][BLACK][RIGHT][RIGHT]STARRING :-"
5250 PRINT"[DOWN][RIGHT]E AS TOMY TOADSTOOL"
5260 PRINT"[DOWN][RIGHT]( AS BERTIE BUN"
5270 PRINT"[DOWN][RIGHT)) AS WALLYS TAIL"
5280 PRINT"[DOWN][RIGHT]Q-A-O-P AS THE CONTROLS"
5290 PRINT"[DOWN][RIGHT][RVSON]WALLY THE WONDA WORM BY SIMON EYRE 1985"
5291 PRINT"[RIGHT][RIGHT][RIGHT][RIGHT]PRESS ANY KEY TO PLAY WONDA WALLY"
5300 POKE198,0:WAIT198,1:POKE198,0
5310 RETURN
6000 DATA60,126,255,255,60,60,60,60
6010 DATA24,60,126,219,219,255,219,153
6020 DATA153,219,255,219,219,129,60,24
6030 DATA3,15,63,231,231,127,63,0
6040 DATA192,248,254,243,243,254,252,0
6050 DATA28,102,251,129,129,255,126,60
6060 DATA56,124,238,195,195,238,124,56

```

# See Micronet 800 in action!

**AVON**  
**Bath.** Boots, 1 Marchants Passage, Southgate. Tel: 0225 64402.  
**Bristol.** Avon Computer Rentals, 16 West Street, Old Market. Tel: 0272 550600.  
**Bristol.** Boots, 59 Broadmead. Tel: 0272 293631.  
**Bristol.** Laskys, 16-20 Penn Street. Tel: 0272 20421.  
**Clevedon.** Computer Centre, 12A Old Street, Clevedon. Tel: 0272 879514.

**BEDFORDSHIRE**  
**Bedford.** Boots, The Harpur Centre, Harpur Street. Tel: 0234 56231.  
**Dunstable.** Dormans, 7-11 Broad Walk. Tel: 0582 38302.  
**Leighton Buzzard.** Datasine, 59 North Street. Tel: 0525 374200.  
**Leighton Buzzard.** Milton Keynes Music & Computers, 17 Bridge Street. Tel: 0525 382504.  
**Luton.** Hobbyte, Unit 16, The Armdale Centre. Tel: 0582 457195.  
**Luton.** Terry More, 49 George Street. Tel: 0582 23391.

**BERKSHIRE**  
**Slough.** MV Games, 245 High Street. Tel: 75 21594.

**BUCKINGHAMSHIRE**  
**Bletchley.** RAMS Computer Centre, 117 Queensway. Tel: 0908 647744.  
**Chesham.** Reed Photo & Computers, 113 High Street. Tel: 0494 783373.

**CAMBRIDGESHIRE**  
**Cambridge.** Boots, 65-67 Sidney Street and 28 Petty Curry Street. Tel: 0223 350213.  
**Cambridge.** Cambridge Computer Store, 4 Emmanuel Street. Tel: 0223 358264.  
**Cambridge.** Logic Sales, Unit 6, Midgate Parade, Peterborough. Tel: 0733 49696.  
**Peterborough.** Boots, 40-42 Bridge Street, Queensgate. Tel: 0733 65352.

**CHESHIRE**  
**Chester.** Boots, 47-55 Foregate Street. Tel: 0244 28421.  
**Chester.** Computer Link, 21 St. Werburgh Street. Tel: 0244 316516.  
**Chester.** Laskys, 7 The Forum, Northgate Street. Tel: 0244 317667.  
**Crewe.** Midshires Computer Centre, 68-78 Nantwich Road. Tel: 0270 211086.  
**Ellesmere Port.** RFR TV & Audio, 1 Pooltown Road, Whitby. Tel: 051-356 4150.  
**Hyde.** C Tech Computers, 184 Market Street. Tel: 061-366 8223.  
**Macclesfield.** Camera Computer Centre, 118 Mill Street. Tel: 0625 27468.  
**Macclesfield.** Computer Centre, 68 Chestergate. Tel: 0625 618827.  
**Marple.** Marple Computer Centre, 30-32 Market Street. Tel: 061-427 4328.  
**Stockport.** National Micro Centres, 36 St Petersgate. Tel: 061-429 8080.  
**Widnes.** Computer City, 78 Victoria Road. Tel: 051-420 3333.  
**Wilmslow.** Wilmslow Micro Centre, 62 Grove Street. Tel: 0625 530890.

**CLEVELAND**  
**Middlesbrough.** Boots, 88-90 Linthorpe Road, The Cleveland Centre. Tel: 0642 249616.

**CUMBRIA**  
**Kendal.** The Kendal Computer Centre, Stramongate. Tel: 0539 22559.  
**Penrith.** Penrith Communications, 14 Castlegate. Tel: 0768 67146.  
**Whitehaven.** P D Hendren, 15 King Street. Tel: 0946 2063.  
**Workington.** Technology Store, 12 Finkle Street. Tel: 0900 66972.

**DERBYSHIRE**  
**Alfreton.** Gordon Harwood, 67-71 High Street. Tel: 0733 836781.  
**Chesterfield.** Boots, 35-37 Low Pavement, Market Place. Tel: 0246 203591.  
**Chesterfield.** Computer Stores, 14 Stephenson Place. Tel: 0246 208802.  
**Derby.** Boots, 1 Devonshire Walk. Tel: 0322 45886.  
**DEVON**  
**Exeter.** Boots, 251 High Street, Tel: 0392 32244.  
**Exeter.** Open Channel, Central Station, Queen Street. Tel: 0392 218187.  
**Paignton.** Computer Systems Ltd, 35 Hyde Road. Tel: 0805 524284.  
**Plymouth.** Syntax, 76 Cornwall Street. Tel: 0752 28705.

**Seaton.** Curtis Computer Services, Seaton Computer Shop, 51c Harbour Road. Tel: 0297 22347.  
**Tiverton.** Actron Microcomputers, 37 Bampton Street. Tel: 0884 252854.

**DORSET**  
**Bournemouth.** Lansdowne Computer Centre, 1 Lansdowne Crescent, Lansdowne. Tel: 0202 20165.  
**Dorchester.** The Paper Shop, Kings Road. Tel: 0305 64564.  
**Poole.** Lansdowne Computer Centre, 14 Armdale Centre. Tel: 0202 670901.

**ESSEX**  
**Basildon.** Basildon Software Centre, 78-80 Liberty Shopping Hall, East Square. Tel: 0268 27922.  
**Braintree.** Mirage Microcomputers Ltd, 24 Bank Street. Tel: 0376 48321.  
**Chelmsford.** Maxton Hayman, 5 Bromfield Road. Tel: 0245 354595.  
**Chelmsford.** Way In Computers, 7 Village Square, Chelmer Village. Tel: 0245 467858.  
**Colchester.** Boots, 5-6 Lion Walk. Tel: 0206 577303.  
**Colchester.** Colchester Computer Centre, 3a Short Wyre Street. Tel: 0206 47242.  
**Grays.** H. Reynolds, 28a Southend Road. Tel: 0375 31641.  
**Harlow.** Harlow Computer Centre, 17 Staple Tye. Tel: 0279 22846.  
**Hornchurch.** Comptel Computer Systems, 112a North Street. Tel: 0402 446741.  
**Ilford.** Boots, 177-185 High Road. Tel: 01-553 2116.  
**Romford.** Software Plus, 72 North Street. Tel: 70 65271.  
**Southend-on-Sea.** Computerama, 88 London Road. Tel: 0702 335443.  
**Southend-on-Sea.** Computer Centre, 336 London Road. Tel: 0702 337161.  
**Southend-on-Sea.** Estuary Personal Computers, 318 Chartwell North, Victoria Circus Shopping Centre. Tel: 0702 614131.

**GLOUCESTER**  
**Cheltenham.** Laskys, 206 High Street. Tel: 0242 570282.  
**Cheltenham.** Screen Scene, 144 St Georges Road. Tel: 0242 528979.  
**Gloucester.** Boots, 38-46 Eastgate Street. Tel: 0452 423501.

**HAMPSHIRE**  
**Basingstoke.** Fishers, 2-3 Market Place. Tel: 0256 22079.  
**Southampton.** Business Electronics, Micromagic At Atkins, 7 Civic Centre Road. Tel: 0703 25903.  
**Waterlooville.** GB Microland, 7 Queens Parade, London Road. Tel: 0705 259911.

**HERTFORD**  
**Hitchin.** County Computers, 13 Bucklesbury. Tel: 0462 36757.  
**Potters Bar.** The Computer Shop, 107 High Street. Tel: 0707 44417.  
**Stevenage.** DJ Computers, 11 Town Square. Tel: 0438 65501.  
**Watford.** SRS Microsystems, 94 The Parade, High Street. Tel: 0923 26602.  
**Watford.** Watford Electronics, Cardiff Road. Tel: 0923 405588.  
**Welwyn Garden City.** DJ Computers, 40 Fretherne Road. Tel: 96 28444.

**HUMBERSIDE**  
**Beverley.** Computing World, 10 Swabys Yard, Dyer Lane. Tel: 0482 881831.

**KENT**  
**Ashford.** DGH, 10 North Street. Tel: 0233 32597.  
**Ashford.** Geerings of Ashford, 80 High Street. Tel: 0233 33366.  
**Bromley.** Boots, 148-154 High Street. Tel: 01-460 6688.  
**Bromley.** Computers Today, 31 Market Square. Tel: 01-290 5652.  
**Bromley.** Walters Computers, Army & Navy, 64 High Street. Tel: 01-460 9991.  
**Chatham.** Boots, 30-34 Wilmott Square, Pentagon Centre. Tel: 0634 405471.  
**Gravesend.** Gravesend Home Computers, 39 The Terrace. Tel: 0474 23871.  
**Gillingham.** Regal Software Supplies, 49 High Street. Tel: 0634 579634.  
**Maidstone.** Kent Micros, 51 Union Street. Tel: 0622 52784.  
**Rainham.** Microway Computers, 39 High Street. Tel: 0634 376702.  
**Sevenoaks.** Ernest Fielder Computers, Dorset Street. Tel: 0732 456800.  
**Shortlands.** The Village House of Computers, 87 Beckenham Lane. Tel: 01-460 7122.

**Sittingbourne.** Computer Plus, 65 High Street. Tel: 0795 25677.  
**Tunbridge Wells.** Modata Computer Centre, 28-30 St. Johns Road. Tel: 0892 41555.

**LANCASHIRE**  
**Blackburn.** Tempo Computers, 9 Railway Road. Tel: 0254 691333.  
**Blackpool.** Blackpool Computers Store, 179 Church Street. Tel: 0253 20239.  
**Burnley.** IMO Business Systems, 39-43 Standish Street. Tel: 0282 54299.  
**Preston.** 4Mat Computing, 67 Friargate. Tel: 0772 561952.  
**Preston.** Laskys, 1-4 Guildhall Arcade. Tel: 0772 59264.  
**Wigan.** Wildings Computer Centre, 11 Mesnes Street. Tel: 0942 22382.

**LEICESTERSHIRE**  
**Leicester.** Boots, 30-36 Gallowtree Gate. Tel: 0533 21641.  
**Market Harborough.** Harborough Home Computers, 7 Church Street. Tel: 0858 63056.

**LONDON**  
**W1.** Computers of Wigmore Street, 104 Wigmore Street. Tel: 01-486 0373.  
**W1.** Laskys, 42 Tottenham Court Road. Tel: 01-636 0845.  
**W1.** Lion House, 227 Tottenham Court Road. Tel: 01-637 1601.  
**W1.** Sonic Foto Micro Center, 256 Tottenham Court Road. Tel: 01-580 5826.  
**W1.** Tomorrows World Today, 27 Oxford Street. Tel: 01-439 7799.  
**W1.** Walters Computers, DH Evans, Oxford Street. Tel: 01-629 8800.  
**WC1.** Transam Micro Systems, 59-61 Theobalds Road. Tel: 01-405 5240.  
**W5.** Laskys, 18-19 Ealing Broadway Shopping Centre. Tel: 01-567 4717.  
**W8.** Walters Computers, Barkers, Kensington High Street. Tel: 01-937 5432.  
**SE7.** Vic Oddens Micros, 5 London Bridge Walk. Tel: 01-403 1988.  
**SE9.** Square Deal, 373-375 Footscray Road, New Eltham. Tel: 01-859 1516.  
**SE15.** Castlehurst Ltd, 152 Rye Lane, Peckham. Tel: 01-639 2205.  
**EC2.** Devron Computer Centre, 155 Moorgate. Tel: 01-638 3339.  
**N14.** Logic Sales, 19 The Bourne, The Broadway, Southgate. Tel: 01-882 4942.  
**N22.** Boots, 38-40 High Road, Wood Green. Tel: 01-881 0101.  
**NW3.** Maycraft Micros, 58 Rosslyn Hill, Hampstead. Tel: 01-431 1300.  
**NW4.** Davinci Computer Store, 112 Brent Street, Hendon. Tel: 01-202 2272.  
**NW7.** Computers Inc, 86 Golders Green. Tel: 01-209 0401.  
**NW10.** Technomatic, 17 Burnley Road, Wembley. Tel: 01-208 1177.

**MANCHESTER**  
**Bolton.** Computer World UK Ltd, 208 Chorley Old Road. Tel: 0204 494304.  
**Manchester.** Boots, 32 Market Street. Tel: 061-832 6533.  
**Manchester.** Laskys, 12-14 St. Marys Gate. Tel: 061-833 0268.  
**Manchester.** Mighty Micro, Sherwood Centre, 268 Wilmslow Road, Fallowfield. Tel: 061-224 8117.  
**Manchester.** NSC Computer Shops, 29 Hanging Ditch. Tel: 061-832 2269.  
**Manchester.** Walters Computers, Kendal Milne, Deansgate. Tel: 061-832 3414.  
**Oldham.** Home & Business Computers, 54 Yorkshire Street. Tel: 061-633 1608.  
**Swinton.** Mr Micro, 69 Partington Lane. Tel: 061-728 2282.

**MERSEYSIDE**  
**Heswall.** Thornguard Computer Systems, 46 Pensby Road. Tel: 051-342 7516.  
**Liverpool.** Hargreaves, 31-37 Warbreck Moor, Walton. Tel: 051-525 1782.  
**Liverpool.** Laskys, Dale Street. Tel: 051-236 3298.  
**St. Helens.** Microman Computers, Rainford Industrial Estate, Mill Lane Rainford. Tel: 0744 885242.  
**Southport.** Central Studios, 38 Eastbank Street. Tel: 0704 31881.

**MIDDLESEX**  
**Enfield.** Laskys, 44-48 Palace Garden Shopping Centre. Tel: 01-363 6627.  
**Harrow.** Camera Arts, 42 St. Anns Road. Tel: 01-427 5469.  
**Harrow.** Harrow Micro, 24 Springfield Road. Tel: 01-427 0098.

**Hounslow.** Boots, 193-199 High Street. Tel: 01-570 0156.  
**Southall.** Twillstar Computers Ltd, 7 Regina Road. Tel: 01-574 5271.  
**Teddington.** Andrews, Broad Street. Tel: 01-997 4716.  
**Twickenham.** Twickenham Computer Centre, 72 Heath Road. Tel: 01-892 7896.  
**Uxbridge.** JKI. Computers, 7 Windsor Street. Tel: 0895 51815.

**NORFOLK**  
**Norwich.** Adams, 125-129 King Street. Tel: 0603 22129.

**NOTTINGHAMSHIRE**  
**Sutton in Ashfield.** HN & I. Fisher, 87 Outram Street. Tel: 0623 54734.

**OXFORDSHIRE**  
**Abingdon.** Ivor Fields Computers, 21 Stern Street. Tel: 0235 21207.  
**Banbury.** Computer Plus, 2 Church Lane. Tel: 0295 55890.  
**Oxford.** Absolute Sound & Video, 19 Old High Street, Headington. Tel: 0865 65661.  
**Oxford.** Science Studio, 7 Little Clarendon Street. Tel: 0865 54022.

**SCOTLAND**  
**Aberdeen.** Boots, 133-141 Union Street. Tel: 0224 585349.  
**Edinburgh.** Boots, 101-103 Princes Street. Tel: 031-225 8331.  
**Glasgow.** Boots, 200 Sauchiehall Street. Tel: 041-332 1925.  
**Glasgow.** Boots, Union Street and Argyle Street. Tel: 041-248 7387.  
**Glasgow.** Tom Dixon Cameras, 15-17 Queen Street. Tel: 041-204 0826.

**SHROPSHIRE**  
**Shrewsbury.** Clairmont Enterprises, Hills Lane. Tel: 3647 52949.  
**Shrewsbury.** Computerama, 13 Castlegate. Tel: 0743 60528.  
**Telford.** Computer Village Ltd, 2 3 Hazeldine House, Central Square. Tel: 0952 506771.  
**Telford.** Telford Electronics, 38 Mall 4. Tel: 0952 504911.

**STAFFORDSHIRE**  
**Newcastle-under-Lyme.** Computer Cabin, 24 The Parade, Silverdale. Tel: 0782 636911.  
**Stafford.** Computerama, 59 Foregate Street. Tel: 0785 41899.  
**Stoke-on-Trent.** Computerama, 11 Market Square Arcade, Hanley. Tel: 0782 268524.

**SUFFOLK**  
**Bury St. Edmunds.** Boots, 11-13 Cornhill. Tel: 0284 701516.  
**Bury St. Edmunds.** Suffolk Computer Centre, 1-3 Garland Street. Tel: 0284 705503.

**SURREY**  
**Bagshot.** P & H Electronics, 22-24 Guildford Road. Tel: 0276 73078.  
**Croydon.** Laskys, 77-81 North End. Tel: 01-681 8443.  
**Croydon.** The Vision Store, 53-59 High Street. Tel: 01-686 6362.  
**Croydon.** The Vision Store, 96-98 North End. Tel: 01-681 7539.  
**South Croydon.** Concise Computer Consultants, 1 Carlton Road. Tel: 01-681 6842.  
**Epsom.** The Micro Workshop, 12 Station Approach. Tel: 0372 721533.  
**Guildford.** Walters Computers, Army & Navy, 105-111 High Street. Tel: 0483 68171.  
**Wallington.** Surrey Micro Systems, 53 Woodcote Road. Tel: 01-647 5636.  
**Woking.** Harpers, 71-73 Commercial Way. Tel: 0486 225657.

**SUSSEX**  
**Bexhill-on-Sea.** Computerware, 22 St. Leonards Road. Tel: 0424 223340.  
**Brighton.** Boots, 129 North Street. Tel: 0273 27088.  
**Brighton.** Gamer, 71 East Street. Tel: 0273 728681.  
**Brighton.** Laskys, 151-152 Western Road. Tel: 0273 725625.  
**Crawley.** Gatwick Computers, 62 The Boulevard. Tel: 0293 37842.  
**Crawley.** Laskys, 6-8 Queensway. Tel: 0293 544622.  
**Eastbourne.** Boots, 15 Eastbourne Armdale Centre. Tel: 03232 7742.

**TYNE & WEAR**  
**Newcastle-upon-Tyne.** Boots, Eldon Square. Tel: 0632 329844.  
**Newcastle-upon-Tyne.** Laskys, 6 Northumberland Street. Tel: 0632 617224.  
**Newcastle-upon-Tyne.** RE Computing, 12 Jesmond Road. Tel: 0632 815580.

**WALES**  
**Aberdare.** Inkey Computer Services, 70 Mill Street, The Square, Trecynon. Tel: 0685 881828.  
**Aberystwyth.** Aberdata at Galloways, 23 Pier Street. Tel: 0970 615522.  
**Cardiff.** Boots, 26 Queens Street & 105 Frederick Street. Tel: 0222 31291.  
**Cardiff.** Cardiff Microcomputers, 46 Charles Street. Tel: 0222 373072.  
**Cardiff.** The Computer Shop, 41 The Hayes. Tel: 0222 26666.  
**Cardiff.** Laskys, 32-36 Town Wall, St. Davids Centre. Tel: 0222 41619.  
**Cardiff.** P & P Computers, 41 The Hayes. Tel: 0222 26666.  
**Cardiff.** Randall Cox, 18 22 High Street Arcade. Tel: 0222 397162.  
**Mold.** Clwyd Personal Computers, Unit 19, Daniel Owen Precinct. Tel: 0352 56842.  
**Newport.** Gwent Computers, 92 Chepstow Road. Tel: 0633 841760.  
**Swansea.** Boots, 17 St. Marys Arcade, The Quadrant Shopping Centre. Tel: 0792 43461.  
**Swansea.** The Microstore, 35-36 Singleton Street. Tel: 0792 467980.

**WARWICKSHIRE**  
**Coventry.** Coventry Micro Centre, 33 Far Gosford Street. Tel: 0203 58942.  
**Coventry.** Impulse Computer World, 60 Hertford Street Precinct. Tel: 0203 553701.  
**Coventry.** JBC Micro Services, 20 Earlson Avenue, North Earlson. Tel: 0203 73813.  
**Coventry.** Laskys, Lower Precinct. Tel: 0203 27712.  
**Leamington Spa.** IC Computers, 43 Russell Street. Tel: 0926 36244.  
**Leamington Spa.** Leamington Hobby Centre, 121 Regent Street. Tel: 0926 29211.  
**Nuneaton.** Micro City, 1a Queens Road. Tel: 0203 382049.  
**Rugby.** O.E.M., 9-11 Regent Street. Tel: 0788 70522.

**WEST MIDLANDS**  
**Birmingham.** Boots, City Centre House, 16-17 New Street. Tel: 021-643 7582.  
**Birmingham.** Laskys, 19-21 Corporation Street. Tel: 021-632 6303.  
**Dudley.** Central Computers, 35 Churchill Precinct. Tel: 0384 238169.  
**Stourbridge.** Walters Computer Systems, 12 Hagley Road. Tel: 0384 370811.  
**Walsall.** New Horizon, 1 Goodall Street. Tel: 0922 24821.  
**West Bromwich.** DS Peakman, 7 Queens Square. Tel: 021-525 7910.

**YORKSHIRE**  
**Bradford.** Boots, 11 Darley Street. Tel: 0274 390891.  
**Leeds.** Boots, 19 Albion Arcade, Bond Street Centre. Tel: 0532 33551.  
**Sheffield.** Laskys, 58 Leopold Street. Tel: 0742 750971.  
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### Programming in BASIC

When you have been involved in computing for several years you tend to forget what it was like to be a raw beginner. Browsing through "Programming in BASIC" brought back memories of those restless nights spent contemplating such earth shattering questions as "What is the difference between numeric and string variables" — we've all been through it.

The book begins at the most elementary level possible, the first program that I encountered was 10 PRINT "END OF CHAPTER ONE" 20 END. As the book is obviously aimed at the absolute beginner, I was puzzled by the next sentence which told the user to save the program to disc. How many absolute beginners have access to a disc drive? Normally by the time you have saved up for your disc system you have progressed far beyond the bounds of this text.

The dialect of BASIC used in the book is APPLE BASIC. Fortunately this is a fairly standard form of the language so conversion of the programs to run on your micro should pose few problems.

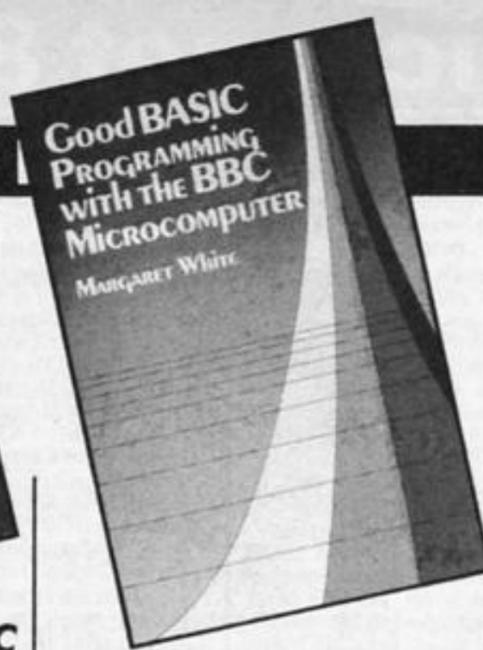
At the beginning of the book the authors emphasise that the main aim of the book is not to teach the user to write lines of code. They hope to introduce the user to the concepts of program specification, design, and finally, implementation. These skills are not language specific and should therefore remain useful no matter in which language, or languages you eventually specialise.

The book certainly covered all of the areas that it set out to, but I found the layout to be rather cluttered and some of the explanatory diagrams rather confusing. **J.R.**

**Price:** £4.95

**Publisher:** John Wiley and Sons

**Author:** John Cookson and Iain Richmond



### Good BASIC Programming with the BBC Microcomputer

The majority of home computer users in the country are self-taught, they have been through the routine of late nights and well-thumbed manuals and emerged at the other end quite capable of writing computer programs which work. It wasn't until I joined a local computer club that I was introduced to the pleasures of good programming. With the release of Margaret White's new book it is possible for newcomers to computing to develop good habits from the beginning, or old hands to see what they have been missing.

The book tackles programming by dividing program production into several logical stages. Having decided upon the specification for your program (i.e. what you want it to do) you are lead into the area of program design. This is dealt with using both flow charts and a generalised form of coding, both of which are used to describe the same program. This generalised coding contains structures that are found in several high level languages e.g. IF ELSEIF ENDIF, CASE ENDCASE, LOOP ENDLOOP. As these are not implemented on the BBC I cannot help feeling that they may lead to some confusion amongst some of the less experienced readers.

The largest part of the book explores BASIC in such a way that it could also be used by owners of other machines.

The book is written using very sound techniques and is an ideal way for the self-taught BASIC programmer to get onto the straight and narrow before it's too late. **J.R.**

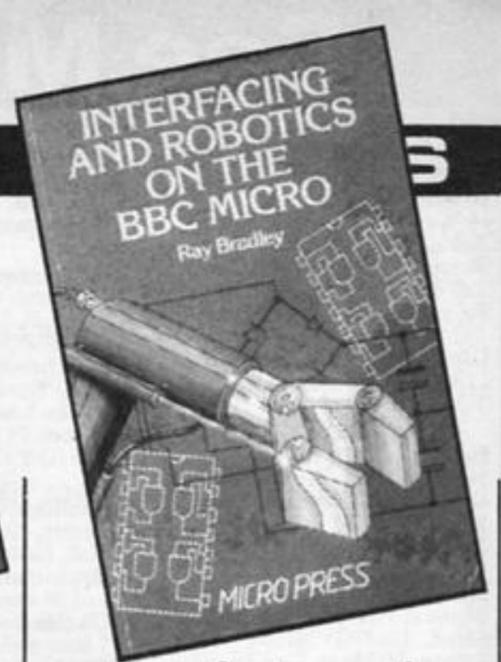
**Price:** £5.50

**Publisher:** Macmillan

**Author:** Margaret White



**BBC**



### Interfacing and Robotics on the BBC Micro

"Control the running of a power station with your computer!" is one of the slogans that has formed part of the sales claims of many computers in the past. "Interfacing and Robotics on the BBC Micro" may not exactly fulfill this purpose but it provides the necessary knowledge to enable you to free your BBC from the confines of its cream box and begin to control various devices in the real world.

The book tackles the subject in a logical manner, thoughtfully providing a chapter on the theory behind much of the electronics (for dummies like me). It moves on to circuit board design and production, hints and tips on soldering, and finally into the heavy stuff of explaining the various ports on the BBC and projects of varying difficulty. The projects include a graphics digitiser, an X-Y plotter, a robot arm, and finally a computer controlled house!

The book expects the reader to be a competent BASIC programmer and preferably have some knowledge of assembly language. In both cases the programs provided are fully annotated allowing them to be easily understood and therefore modified should the user wish to improve the projects at a later date.

Electronics was a subject that I was never taught at school, and I have never even thought about delving into the hardware side of my BBC computer, yet after reading Mr. Bradley's book I feel excited about the whole idea. The book has been written in such a clear and concise way that it cannot help but instil confidence in the reader. **J.R.**

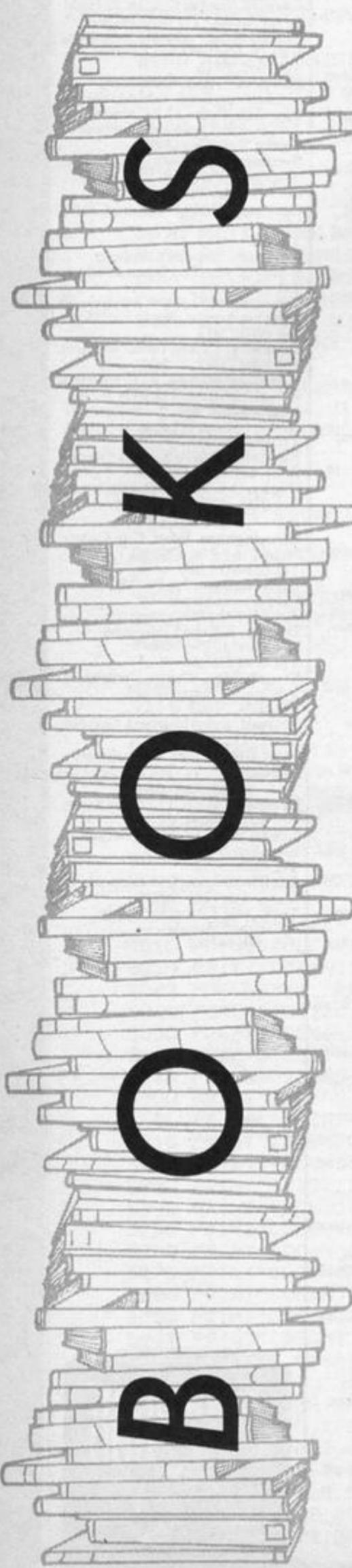
**Price:** £15.95

**Publisher:** Micro Press

**Author:** Ray Bradley



**BBC**



# TOP 20

Compiled by

Gallup

# SOFTWARE

Fortnight Ending July 19, 1985



A great deal of movement this week but no new entries.

The top spot has changed again and it will be interesting to see how long the Fist can keep hold of its current position.

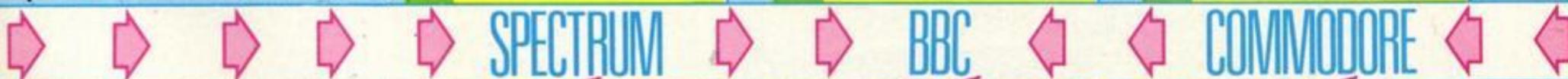
Hypersports brings the number of Imagine games in the top 20 to two. I thought that after last years events that would never happen again. Well, you can't be right all the time.

In the lower reaches of the chart we have a number of new entries. Highest of these being the superb graphic game from Quicksilva, Glass.

Other new entries, all below 45, are Graham Gooch's Test Cricket, Spectipede, Dynamite Dan and Subsunk. We will have to wait for another fortnight to see if they can move any higher.

For those who like statistics the longest stayer in the chart this week is Daley Thompson with over 35 weeks in the running. Football Manager has also been there for 35 weeks!

LAST WEEK	MOVE	THIS WEEK	TITLE	PUBLISHER						
					SPECTRUM	CBM 64	ELECTRON BBC	AMSTRAD VIC-20	ATARI	OTHERS
2	▲	1	Way of the Exploding Fist	Melbourne House			●			
14	▲	2	Hypersports	Imagine	●					●
3	●	3	Soft Aid	Various	●	●				
1	▼	4	Elite	Firebird		●	●	●		
5	●	5	Cauldron	Palace	●	●				
30	▲	6	Rocco	Gremlin	●					
8	▲	7	Jet Set Willy 2	Software Projects	●	●				
12	▲	8	Combat Lynx	Durrell	●	●	●	●		●
24	▲	9	Action Biker	Mastertronic	●	●				
6	▼	10	Spy Hunter	US Gold	●	●				
9	▼	11	Rocky Horror Show	CRL	●	●				●
28	▲	12	Daley Thompson's Decathlon	Ocean	●	●				●
18	▲	13	Spy vs Spy	Beyond	●	●				
10	▼	14	Alien 8	Ultimate	●	●	●			●
15	●	15	World Series Baseball	Imagine	●	●				
4	▼	16	View to a Kill	Domark	●	●				
34	▲	17	Gremlins	Adventure Int	●	●	●	●		●
16	▼	18	Pitstop 2	Epyx/US Gold		●				
7	▼	19	Shadowfire	Beyond	●	●				
13	▼	20	Knight Lore	Ultimate	●		●			●



## SPECTRUM

## BBC

## COMMODORE

### Top Ten

- Hypersports  
Imagine
- Rocky  
Gremlin
- Softaid  
Various
- Cauldron  
Palace
- Jet Set Willy 2  
Software Projects
- Spy Vs Spy  
Beyond
- Spy Hunter  
US Gold
- World Series Baseball  
Imagine
- Glass  
Quicksilva
- Bruce Lee  
US Gold

### Top Ten

- Revs  
Acomsoft
- Combat Lynx  
Durrell
- Alien 8  
Ultimate
- Knight Lore  
Ultimate
- Elite  
Acomsoft
- Mini Office  
Aardvark
- Repton  
Superior Software
- Attic Attac  
Ultimate
- Castle Quest  
Micro Power
- Football Manager  
Addictive Games

### Top Ten

- Way of the Exploding Fist  
Melbourne House
- Elite  
Firebird
- Soft Aid  
Various
- Pitstop 2  
US Gold
- International Tennis  
Commodore
- International Basketball  
Commodore
- Dambusters  
US Gold
- Action Biker  
Mastertronic
- Kik Start  
Mastertronic
- Impossible Mission  
Epyx/US Gold

**Oric oddments**

In your sixth article on BASIC conversion you printed that the oric doesn't have any commands for the loading/saving of basic variables.

Although the Oric-1 hasn't got any commands the Atmos has the following for saving arrays, STORE a\$, "filename" or STORE a, "filename" or STORE a%, "filename".

Store saves the complete array only. For loading of arrays the Atmos has the following, RECALL a\$, "filename" or RECALL a, "filename", or RECALL a%, "filename".

When using RECALL the array must have been dimmed first, eg to RECALL a\$, DIM AS(x) RECALL AS, "filename". Where x is the number of how many dimensions the array AS has.

How about a few more software reviews and perhaps a software chart for Oric owners?

**D Goodrum, Norwich**

*We are sorry if we caused any confusion with our conversion chart. The Atmos does have those commands but ORIC 1 doesn't.*

*With regard to reviews we can only reflect the software market at the moment, if there are no ORIC programs being released we cannot review them!*

**Whoops**

Due to an unexpected error with our Spectrum printer interface the World Flags listing in HCW 121 was printed incorrectly.

The user defined graphics were printed as spaces in lines 6510, 6920, 7020, 7500 and 8620.

So that you may correct your programs we print below the relevant sub-routines and ask that you accept our apologies. The program is worth the time, honest!

**Review revival**

I would like to put a few points forward about your magazine. I purchased your mag when the new-look edition came out and as I am a TI-99/4A user I've noticed there have only been a few reviews for it since the change round.

There are many new tape games out now and even more cartridges so what is wrong with reviewing games like Zork, 1,2,3 or Hitch-Hikers Guide to the Galaxy? The few programs that you do review are always tapes — not cartridges!

In HCW 119 you wrote about sound for different computers. Why write about sound for the Spectrum which isn't very good at all but leave out the TI which has some of the best sound around? I must say however that your magazine is way ahead of the others when it comes to supporting the TI.

**Darran Parker, Giltbrook, Notts**

**Capital complaint**

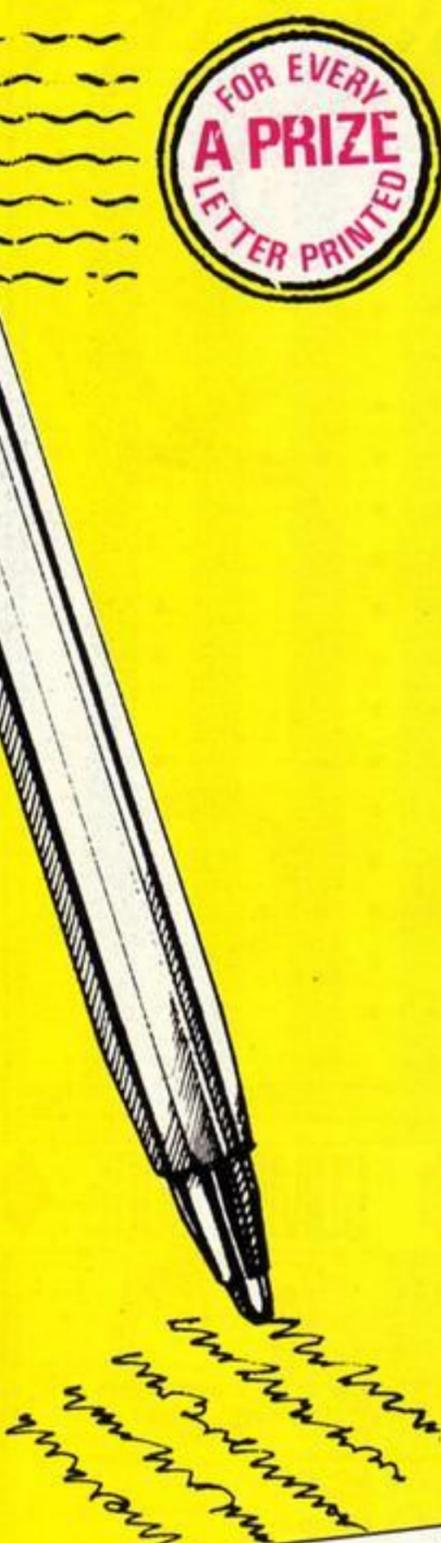
As a regular reader of HCW I am a little disappointed with the new layout. No one objects to the five-pence price rise but it would appear that all we have in exchange is a great deal more adverts.

I appreciate that you could not exist without advertising, but it gets a bit boring when there is too much. Where are all the London based computer repairers? They don't seem to exist!! All adverts seem to be from firms outside London.

True, it's not your fault but it's time London engineers pulled their fingers out and started advertising for London computer owners in our London based magazine, HCW.

In your reviews it is rarely mentioned if the game is joystick or cursor controlled — or both. Pensioners like myself, who find the hardware too expensive and have problems using a joystick would find this information most helpful.

**L T Rees, London N1**



Home Computing Weekly,  
No 1 Golden Square,  
London W1R 3AB.

```

6499 REM West Germany
6500 LET p=0: GO SUB 1200
6510 FOR f=8 TO 13: PRINT AT f,4: PAPER 6: IN
K 2: "AAAAAAAAAAAAAAAAAAAAAAAA": NEXT f
6530 LET p=6: GO SUB 1400
6550 RETURN

6899 REM India
6900 LET p=7: GO SUB 1300
6910 LET p=4: GO SUB 1400
6920 FOR f=2 TO 7: PRINT AT f,4: BRIGHT 1: PA
PER 6: INK 2: "AAAAAAAAAAAAAAAAAAAAAAAA": NEXT
f
6950 RETURN

6999 REM Irish Rep
7000 LET p=4: GO SUB 1500
7010 LET p=7: GO SUB 1600
7020 FOR f=2 TO 19: PRINT AT f,20: BRIGHT 1:
PAPER 6: INK 2: "AAAAAAA": NEXT f
7050 RETURN

7499 REM Norway
7500 FOR f=2 TO 19: PRINT AT f,4: PAPER 6: IN
K 2: "AAAAAAAAAAAAAAAAAAAAAAAA": NEXT f
7510 GO SUB 2100
7520 LET p=1: GO SUB 1800
7550 RETURN

8599 REM U.S.S.R.
8600 LET p=2: GO SUB 1000
8610 LET x=62: LET y=144: LET s=5: INK 6: GO
SUB 1900: INK 7
8620 PRINT AT 5,7: PAPER 2: INK 6: "BC": AT 6,
6: "DEF"
8650 RETURN
    
```

NICK FALDO  
PLAYS THE

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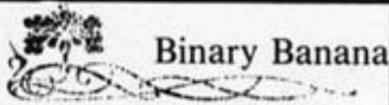
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Cricket, limited overs test match (HCW  
★★★★). £4.99 each, 2 for £8.99 or 3 for  
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Street, Haslingden, Lancashire BB4 5LS

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heim Walk, Corby, Northants.

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SSN0264-4991





Reader's hi-score table

Name	Game	Machine	Score
James Donnan	Chuckie Egg	BBC	519,160 (level 38)
	Pole Position	BBC	112,570 (lap 8)
Shaun Lowe	Bruce Lee	Spectrum	547,450
Glenn Gilney	Bruce Lee	Spectrum	246,175
Mark Grove	Zaxxon	C64	53,100
	Pole Position	C64	89,480
	Pooyan	C64	104,250
	Breakdance	C64	3,917
	Theatre Europe	C64	96%

Helpline

Here are some more Staff of Karnath hints from Ian Longdon of Hinckley for the C64 version.

To get the piece of the pentacle in the library, shoot it with the yercbors spell and the skeleton won't appear. In the store room, shoot the spider with the Ibrahim spell.

A ting will sound, so rush through the kitchen to the store room and the piece will be on the floor. In the morning room, shoot the plant pot on the table a few times with the Ibrahim spell from the left hand door.

The piece in the Timeless room is obtained by shooting the carpet with the Throbin spell, and then acting quickly. The serpent can be levitated using the Knossos spell.

From the heart of Texas

I would like to congratulate you on a great magazine. I wonder if you could please help me and my friends who all own TI-99/4A's. All we ask is could you please answer these questions.

Are Pyramid from Mogul and Wheeler Dealer from Mr Chips Software Basic or Extended Basic? Can I order direct from these companies?

If you could help us it will be so good, not just for us but for other TI owners.

Keep up the good work and thank you for supporting the good old TI-99/4A computer.

A McIntyre, Newport

Nottingham obviously has some very interesting computer games (and stores) if this press cutting from Tim Love is anything to go by!

NOTTINGHAM TRADER PAGE 23  
JUNE 26, 1985

Amstrad

1. View To Kill
2. Elite
3. Rocky Horror Show
4. Dam Busters
5. Way Of The Exploding Cyst

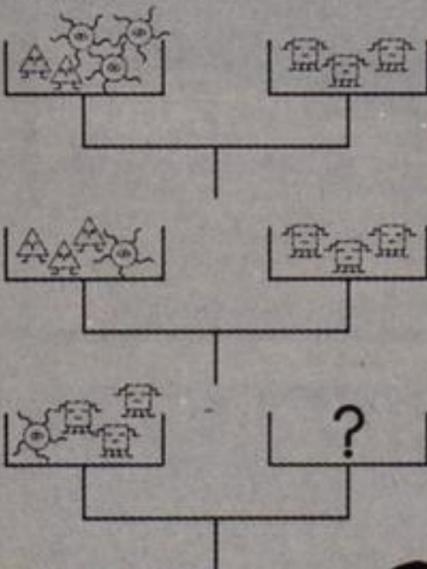
C.B.M. 64

1. Nightlaw
  2. Beach Head
  3. Alien 8
  4. Ghostbusters
  5. Super Pipeline II
- Charts supplied by Telstar and V.H.S., Huntingdon Street.

If any of you find any mistakes of this kind in any other publication (including HCW) please send them to us. You'll get a prize if we print it!

Balancing Act

How many triangles are needed to make the third pair of scales balance?



Contacts

Manchester now has its very own Amstrad Users Club offering a monthly newsletter, computer pen pals, a software library and many more services for Amstrad owners. For further details write to:

M.A.U. Club, c/o S J Stanner,  
21 Gatling Avenue, Longsight, Manchester M12 5SX

I am 18 years old and would like to hear from someone who owns a C16.

David Chambers, 22 Reilly St,  
Banbridge, Co Down,  
Northern Ireland BT32 3DW

I own a 48K ZX Spectrum and I am willing to hear from anyone who has an interest in Spectrum machine code, programming and graphics.

G L Davies, 21 Lovel Rd,  
Speke, Liverpool L24 0ST

All night Chuckie Egg

I have just read about your egg addict, Stephen Doherty, in HCW 116, and I decided to write and tell you about my efforts, although it's a long time since I passed level 132. Last Christmas, my brother received Chuckie Egg from my parents and during most of the holidays my brother, father, sister and I were up until about 2 am playing the game, sometimes even all night.

My mother abandoned us at 11 pm. At the end of all this, father reached level 15, my brother got to level 21, my sister level 26 and I made it to 46 with a score of 400,000 and several empty coffee mugs.

The worst level so far seems to be level 32, the bug duck keeps getting me! After that the geese and ducks just seem to be getting faster and faster and now they tell me that Chuckie Egg 2 has come out. Is there no end in sight for my bruised fingers?

To relieve my misery I have written this letter to you, if only to get a female name on the high score table.

Lucy Bird, Kenton



**“These days, my favourite things are in bits...”**

**WITCH'S CAULDRON**

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**HERBERT'S DUMMY RUN**

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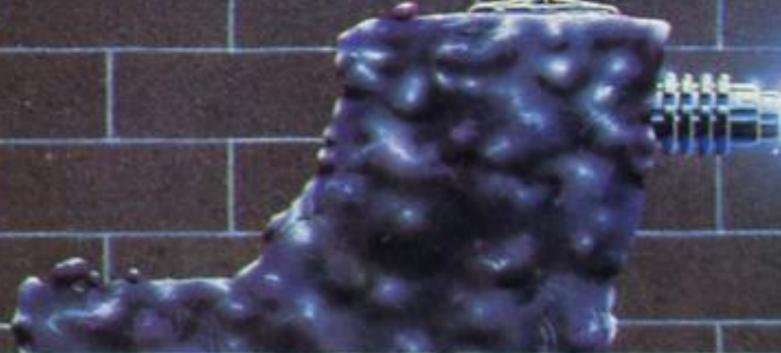
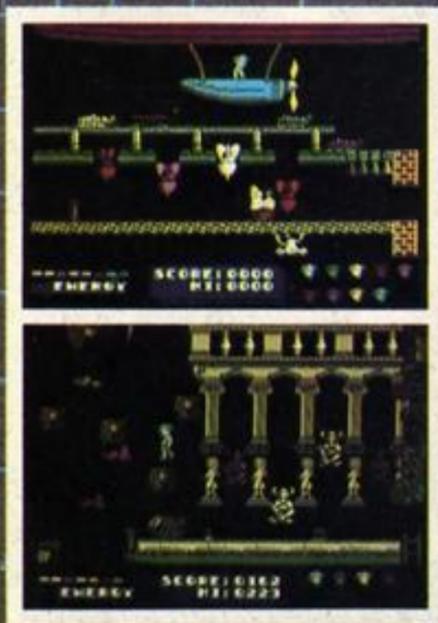
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